RCEME TECHNICAL BULLETIN

JAN

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1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
8 (8)	9 (9)	10 (10)	11 (11)	12 (12)	13 (13)	14 (14)
15 (15)	16 (16)	17 (17)	18 (18)	19 (19)	20 (20)	21 (21)
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FEB

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			1 (32)	2 (33)	3 (34)	4 (35)
5 (36)	6 (37)	7 (38)	8 (39)	9 (40)	10 (41)	11 (42)
12 (43)	13 (44)	14 (45)	15 (46)	16 (47)	17 (48)	18 (49)
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MAR

S	M	T	W	T	F	S
			1 (60)	2 (61)	3 (62)	4 (63)
5 (64)	6 (65)	7 (66)	8 (67)	9 (68)	10 (69)	11 (70)
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19 (78)	20 (79)	21 (80)	22 (81)	23 (82)	24 (83)	25 (84)
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APR

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16 (106)	17 (107)	18 (108)	19 (109)	20 (110)	21 (111)	22 (112)
23/30	24 (114)	25 (115)	26 (116)	27 (117)	28 (118)	29 (119)

MAY

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	1 (121)	2 (122)	3 (123)	4 (124)	5 (125)	6 (126)
7 (127)	8 (128)	9 (129)	10 (130)	11 (131)	12 (132)	13 (133)
14 (134)	15 (135)	16 (136)	17 (137)	18 (138)	19 (139)	20 (140)
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JUN

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				1 (152)	2 (153)	3 (154)
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JUL

S	M	T	W	T	F	S
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2 (183)	3 (184)	4 (185)	5 (186)	6 (187)	7 (188)	8 (189)
9 (190)	10 (191)	11 (192)	12 (193)	13 (194)	14 (195)	15 (196)
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23/30	24/31	25 (206)	26 (207)	27 (208)	28 (209)	29 (210)

AUG

S	M	T	W	T	F	S
		1 (213)	2 (214)	3 (215)	4 (216)	5 (217)
6 (218)	7 (219)	8 (220)	9 (221)	10 (222)	11 (223)	12 (224)
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20 (232)	21 (233)	22 (234)	23 (235)	24 (236)	25 (237)	26 (238)
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SEP

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					1 (244)	2 (245)
3 (246)	4 (247)	5 (248)	6 (249)	7 (250)	8 (251)	9 (252)
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17 (260)	18 (261)	19 (262)	20 (263)	21 (264)	22 (265)	23 (266)
24 (267)	25 (268)	26 (269)	27 (270)	28 (271)	29 (272)	30 (273)

OCT

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1 (274)	2 (275)	3 (276)	4 (277)	5 (278)	6 (279)	7 (280)
8 (281)	9 (282)	10 (283)	11 (284)	12 (285)	13 (286)	14 (287)
15 (288)	16 (289)	17 (290)	18 (291)	19 (292)	20 (293)	21 (294)
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29 (302)	30 (303)	31 (304)				

NOV

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			1 (305)	2 (306)	3 (307)	4 (308)
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17 (351)	18 (352)	19 (353)	20 (354)	21 (355)	22 (356)	23 (357)
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This Technical Bulletin is issued under the authority of Lieut Colonel GW Bruce, CD, A/SSO Maint, Ld Mat Maint, Materiel Command Headquarters. The contents have been approved for publication by Lieut Colonel JP Sherren, CD.

The Bulletin is published to assist RCEME personnel in keeping abreast of current trends in developments, to amplify or emphasize technical instructions, to circulate news of Corps and individual activities, and to provide a forum for discussion and the exchange of ideas by members of the Corps. The information and statements herein do not necessarily represent official policy and are not to be quoted as authority for action.

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CURRENT EVENTS

There are a number of developments which have taken place in the field of maintenance with which RCEME personnel should be familiar. All of these are in the specific area of land materiel maintenance - the traditional area occupied by RCEME. The first of these developments was the extension to the RCN of Army responsibilities for maintenance of RCN motor transport which involves the use of army procedures and the provision of spare parts. This change was instituted 21 Apr 65. The intention during the initial phase is solely to introduce army procedures, accounting documents and reports, and provide a channel for technical direction.

This development has been followed by the extension of RCEME control and accounting procedures to the Mobile Support Equipment (MSE) maintenance sections of the RCAF. These sections perform unit and field repairs to MSE equipment, which is largely composed of vehicles. To familiarize RCAF MSE maintenance personnel with these procedures a series of short instructional courses were conducted at the RCEME School and over 100 RCAF personnel attended. To meet the information requirement of the RCAF and to adapt existing RCAF methods to the new procedures, a number of changes to current Army procedures have been necessary. This has required rewriting a number of EME Manual instructions. These changes will be reflected mainly in amendments to Management K 010 and a new instruction dealing specifically with the RCAF, Management K 007.

As a result of these actions all land materiel maintenance organizations will be using the same control and accounting procedures to manage their maintenance activities, with the ultimate aim of standardizing vehicle maintenance in the Canadian Forces.

THE PRACTICAL OPERATION OF A RCEME FIELD UNIT

By Major P. Bateson

The aim of this paper is to discuss CAMT 11-3, Operation of a Field Unit, where it differs from actual practice and where, in my opinion, it requires revision. My opinions are in all probability controversial and it is hoped that they may inspire some constructive discussion in future issues of the Bulletin.

In paragraph 105 there is a complete description of a set of Commander's Records which may be suitable and useful for a static workshop but are of no practical use to a Field Workshop Commander.

For a proper understanding of what records are required it must be appreciated that in operations there is no such thing as "Awaiting Acceptance". When a piece of equipment breaks down it is either repaired in situ immediately, or brought into the workshop and repaired there immediately. Only a few pieces of equipment (usually radio sets or similar equipments) remain in the shop over 48 hours. If it takes longer to repair it will, during operations, be reallocated or backloaded as beyond local repair. There seems to be some sort of mesmerism in the control office 'acceptance date' philosophy; this procedure is not necessary for a field workshop. This was proved in 4 Fd Wksp where an 'open door' policy, with a guaranteed 14-day repair limit for all equipments, has been in effect for more than a year.

To this can be added the fact that the CO's office is a 3/4-ton van and the control office, or Command Post as I prefer to call it, a 2 1/2 ton office van, both of which may have to move at a moment's notice. Obviously any boards using hooks and discs as described in this paragraph are completely out of the question.

Nor is there any need for the CO to have all the information listed at his finger tips. It must be appreciated that a field workshop now has a strength of 378 all ranks. It is futile, and a complete waste of time, for the CO to try and keep track of all leaves, sickness, courses, etc. He must rely upon his platoon commanders to look after all these routine matters. I know of no better system for the Platoon Commander than the tried and true platoon commander's notebook. 1 Fd Wksp developed such a notebook in 1959 and submitted it to AHQ as a suggestion. Pages were printed with headings for all pertinent information and filed in a small loose-leaf notebook. The notebook stayed with the platoon, and the relevant page accompanied the individual on posting. A sample notebook should be reproduced as an aid to new Platoon Commanders.

How can the CO and unit HQ keep track of work load, personnel and vehicles? A daily state of work in progress, awaiting labour, awaiting parts and holdings of major assemblies is quite sufficient. This state is usually produced for Brigade HQ and/or CREME anyway, so all the CO needs is a copy for his office. His main control, however, is achieved by regular visits to the Command Post and the production platoons. A tour twice a day is sufficient and not at all onerous. Detailed knowledge of all jobs is the responsibility of the 2IC who can and should be in the picture on every job in the shop.

Establishments, both men and vehicles, can best be controlled by use of a loose leaf binder. There is generally a need for two such binders. The Administrative Officer must maintain one to show authorized establishments, actual holdings, surpluses and deficiencies. The 2IC probably needs one too, to show where people are actually employed, because employment invariably differs from establishment. These binders are easily amended, carried and stored. Each platoon prepares its own daily parade state which provides the platoon commander with the disposition of his personnel. These are consolidated daily by the regimental office to provide the CO with the information he requires. The face of a parade state shows the disposition by numbers only; it is useful to show on the reverse the names of personnel in hospital and detention.

Chapter 2 is out of date now to the extent of one complete FRP. The field workshop establishment in Europe calls for two FRPs giving a total strength of 378 all ranks.

There are two major errors in the organization as shown. One, the AO MUST be at least a captain; and two, electronics must be a separate platoon.

The AO combines all the duties of an Inf Bn 2IC, QM, TO and Adjt. This is for a unit of 378 (only 100 less than Armd Regt) and a fleet of 125 vehicles (the same as an Armd Regt excluding tanks). There are not many captains let alone lieutenants who can do the work of one Inf Maj, two Inf Capts and one Ordnance Capt. The problem can be alleviated in part by making the RCOC Platoon Commander the QM. There is no reason why the RCOC Pl cannot consist of a QM section and a spare parts section. Now that there is no difference in the titles of the tradesmen employed in these sections, such an organization is even more feasible and would improve the flexibility of the Ordnance services.

The arguments for proposing a separate platoon for electronics is based on the high degree of specialization required in this platoon and the large work load it has recently acquired. The platoon commander should be specially trained and should be the adviser to Brigade HQ on electronic maintenance, much the same way as the AC Platoon Commander is the Brigade AC Maintenance Officer. Considering only one facet of the work load; each Bde Gp has recently received over 300 APCs, each with at least one radio set, some with two or more. It is interesting to note that with the introduction of these APCs and a corresponding decrease in wheeled vehicles the workshop in Europe received an establishment increase of some 50 vehicle technicians and only one measely Cfn Radio Technician. Or to draw another comparison the AC Platoon has a total of 5 technicians to perform the inspections and repairs for 10 radio sets (7 helicopters plus 3 fixed wing AC) plus some associated equipment, while to do the same for the ground equipment of over 350 radio sets the establishment calls for only 14 technicians. To round out this new platoon and to centralize and rationalize electronic repair the electricians should be included.

At the same time the weapons section should be reconstituted into a separate weapons platoon. Some of the welders (metals technicians) should be allocated to this platoon. This platoon may not appear as necessary in peace time when weapons are not used much. In war, however, I would venture to predict a much greater work load. In any case I think my argument for two separate platoons holds as much logic as trying to wed two such diverse operations as weapons and electronics into one homogeneous platoon.

If you read the Duties and Responsibilities of the Workshop Sergeant Major and the Platoon Commanders, paragraphs 217 and 278 respectively, it is difficult to determine who commands what! Sub-paragraph b for both these appointments are exactly the same. Surely the Workshop Sergeant Major has a different job from a Platoon Commander. The former should be employed as an assistant and stand-in for the 2IC on all matters related to production. He is the 2IC's production trouble shooter; he should also assist the Platoon Commanders with their production problems. He is also adviser to the CO and other officers on trades training and upgrading; however, the detailed planning and implementation of this is the responsibility of the Platoon Commander.

At present there are no radios on workshop entitlements. All reference to them should either be deleted or treated as 'if available'. This presents some nice problems in communications. There is always a shortage of despatch riders when no radios exist. As long as this situation exists it is misleading to imagine that detached FRPs or the AC Pl can be supported by the workshop. Without radio communications such support can, at best, be only nominal.

Paragraph 233 suggests some limitation of the degree of command of the RCOC Platoon. This platoon is under command for all purposes and is no different from any other. Technical advice is available from the BOO to assist the CO in the normal manner. Any idea that the CO OFP has any responsibility or powers with regard to this platoon is a fallacious throw-back to the days when it was attached to the workshop from the OFP. In Europe the CO OFP exercises the powers of a depot commander for purposes of write-offs under QR & O 36.20 (2)

Column (2). The CO 4 Fd Wksp has exactly the same powers with respect to the RCOC Platoon.

I do not agree with the sequence of events described in Chapter 3, Movement. I have discussed this in detail in my article "The Mobility of a Field Workshop" in the Feb 61 Technical Bulletin (NOTE: If you look this up you will find it was credited in error to Capt H. W. Chapman). Without rehashing old arguments the CO should select the workshop site, layout and defence plan. These are the three most important factors resulting from a move and therefore cannot legitimately be delegated. The distance from old to new location is nearly always too great to allow the CO to return to the old site and despatch an advance party. The 2IC (Production Officer) is in the best position to close down the workshop because he knows intimately each job.

The sequence of events in a move then becomes:

a. Receipt of warning order,
b. COs O group, issues:

   (1) Warning order,
   (2) RV at or near new location for Advance Party and Main Body,
   (3) Special instructions re clearing up work and closing down,

c. CO and recce party departs; consists of CO, driver and DR,
d. CO selects site, negotiates adjustments if necessary with OIC BAA or DAA,
e. DR guides Advance/Harbour Party into area,
f. CO details areas including defensive responsibility and priorities. Platoon guides reconnoitre areas, report back for adjustments if necessary,
g. Guides then prepare for reception of unit (see below for details).

h. At given time following move in, usually half an hour after last platoon arrives, CO holds O group,
i. Inform formation HQ of location, etc.

This method reduces the travelling time of all to an absolute minimum. It will cope with all situations from a crash move with no warning, to a well planned move. In my experience it only has one drawback - the CO finds himself eating a lot of old stale sandwiches.

The most difficult phase of any move is the occupation of the new site, particularly if it is done at night. Only by using well-trained experienced men as guides can this be done efficiently and smoothly. Guides must be familiar in detail with each and every vehicle including trailers in their platoons. They must know exactly the working requirements, power requirements and manoeuverability of each vehicle. For these reasons I disagree entirely with paragraph 324 which states that guides should be junior NCOs. The minimum rank of the platoon guide should be sergeant and preferably staff sergeant. He should have a Cfn or junior NCO with him to assist.

The training pamphlet should emphasize aids to deployment such as mine tape to guide drivers into dark woods; paper or metal tags with vehicle tactical numbers to show locations.

The advance party should carry line with them and as soon as the duty-centre trailer is sited they should lay line to the future platoon HQ location. Usually the advance party has a short period of daylight when they can do this. When the main body arrives they can immediately hook up their telephones and be in communication within a matter of minutes.

The most likely location in Europe for a workshop is a village or farm complex. This presents some special problems which, because they cannot be practiced in Canada, should be included in the pamphlet. Chiefly, the problem is one of deployment off a narrow road with vehicles ending up in a position where they can easily move out. This usually involves a deal of backing and manoeuvering which halts the remainder of the convoy. A harbour area to conceal waiting vehicles is essential for this type of operation.

No mention is made of the extreme vulnerability of the workshop as it is deploying. Drills must be established to provide platoon sentries immediately the platoon arrives, until deployment is complete and the proper coordinated defensive plan is in operation.

The O Group described in paragraph 326

is far too unwieldy. Section heads are not required; only platoon commanders, the workshop and company sergeant majors should attend.

Paragraphs 232 and 418 mention the siting of the AC Platoon. No guidance is given as to what constitutes a landing strip. The principle of siting the AC Platoon near the Brigade Airstrip should be avoided. In this location valuable tradesmen may be filtered off to general duties for air landing and loading tasks not properly their responsibility. It should be remembered that the major work load of this platoon is repairing helicopters which if flyable can land practically anywhere. The high reliability of current fixed wing aircraft seldom requires them to come into the AC Platoon. If they cannot land at the workshop an MRT can easily be sent to their location.

The most critical factor in any defensive plan is communications and this is not even mentioned in Chapter 6. Each platoon has a telephone off the unit switchboard. These telephones are located at the platoon HQ which, very often, is not the platoon CP in an attack. It should, therefore, be SOP to lay an extension line from the platoon HQ to the CP and whenever a stand is ordered the handset is moved to the latter location. At the same time the switchboard operator should set up a conference call. In this manner all platoons and the HQ are in constant communication throughout an attack.

No mention is made of the organization for defence. Each platoon should be organized into sections similar to infantry sections. These sections should correspond as far as possible to the working organization. Every man must know exactly who is his section leader and 2IC. If this is done platoons can react quickly to orders and adjustments such as creating a reserve or sending out a patrol.

One of the tasks frequently given a service unit is area security within the BAA. This can best be done using a combination of standing and roving patrols. The latter can be on foot or mounted. One of the essentials for effective area security is radio communication. Bde HQ must provide 510 sets so that patrols can communicate with unit HQ. Without these communications there is reasonable doubt that any effective area security can be achieved.

The physical area occupied by a workshop is so large that an effective defence against a determined enemy of more than section strength is extremely hazardous. The answer to this, of course, is not to let the enemy find you. It is foolish not to post any unit signs, as this would cause as much confusion and frustration to our own troops as it would the enemy. Signs, however, do not have to be posted all over like Burma Shave. The guiding principle should be that an absolute minimum of signs be used, and they be placed in an inconspicuous location where someone who knew the general area of the unit and was looking for such a sign would see it.

Camouflage and concealment are, of course, major aids to staying out of sight of the enemy. No mention, however, is made of another aid; deception. It is entirely feasible to work a deception plan; this also has been proved by 4 Fd Wksp operating against an uncontrolled enemy. The basis of the plan is to use a report centre remote from the workshop, and to deliberately make this report centre look like all or part of the workshop. This is done by siting it in an area that could in fact be a workshop site and using, say, part of the Recovery Platoon to man it, or to use it as a crock park. It is remarkable how effectively such a simple device confuses an enemy force.

No guidance is given to the mechanics of sentry duty. Sentry drills and challenging are generally very poor; this is not remarkable because nowhere in his training is the soldier taught how this should be done. Sentries should be mounted in pairs, one to cover and one to challenge. On the approach of an intruder the challenging sentry either waves down the vehicle or halts the intruder with the challenge "Halt! Who goes there?" The halting should be done unobtrusively and as quietly as possible. You will get a more realistic reception from a driver if you suddenly pop up in front of him than if you stand in the middle of the road waving him down. The identity of the intruder must then be established using the password. The sentry gives the sign, or first part of the pass-

(Continued on page 8)

AUTOCOLLIMATION

By WO 2 WE Davis

Collimation is a term which is used and understood by all technicians trained in the art of optical instrument repair. It is also used by these same technicians on occasions when persons, not familiar with the term, seek diagnosis of the ailments of their favourite binoculars. It is no longer necessary to be baffled with science when you are told that your binoculars are out of collimation, if you mentally substitute the word "alignment" for "collimation".

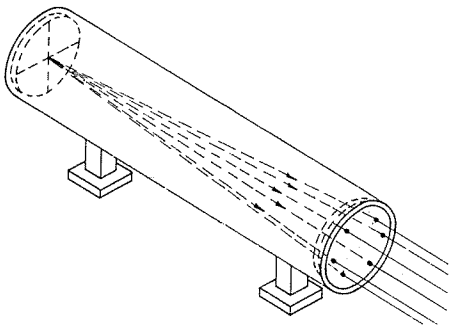
The instrument technician understands collimation as being the alignment of an optical axis to a mechanical axis, a bearing surface, a reference surface or to another optical axis. In order to carry out collimation correctly it may be necessary to satisfy just one or any combination of the above requirements. This is the case with binoculars. They must be adjusted to meet two requirements simultaneously. Each optical axis must be correctly aligned to the mechanical (hinge) axis as well as being aligned to each other.

The basic item of test equipment required to achieve any alignment of an optical axis is called a collimator. It usually comprises a tubular body with a lens installed at one end and a reference mark or reticle at the other. The collimator may also be fitted with longitudinal and cross-levelling vials.

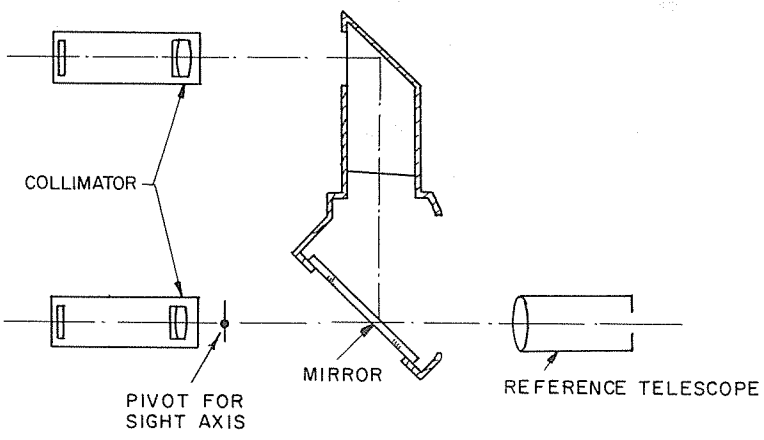
This one item of equipment provides the technician with a reference mark located at a simulated distance of infinity and positioned to permit adjustment of an optical instrument with respect to both horizontal and vertical planes of movement. Until a few years ago all instruments could be adjusted using such a collimator and a single set up of test equipment.

This is now no longer true. The introduction of new types of optical instruments is resulting in the development of new and more complicated testing techniques. Two or more collimators are sometimes required simultaneously in one test set-up. Testing adapters must be accurately machined because known reference surfaces, trunnions, etc, are used as datum points in the collimation procedure. Each instrument requires its own specific testing distance, which may fall anywhere between 50 yards and infinity.

Each of these new requirements is in turn creating problems. There are not enough optical testing collimators to meet the requirements of multiple set-ups. The cost of the adapters is high and each new adapter must be supplied with a robust storage case to prevent damage to the accurately-machined surfaces.



Basic Collimator Optical System



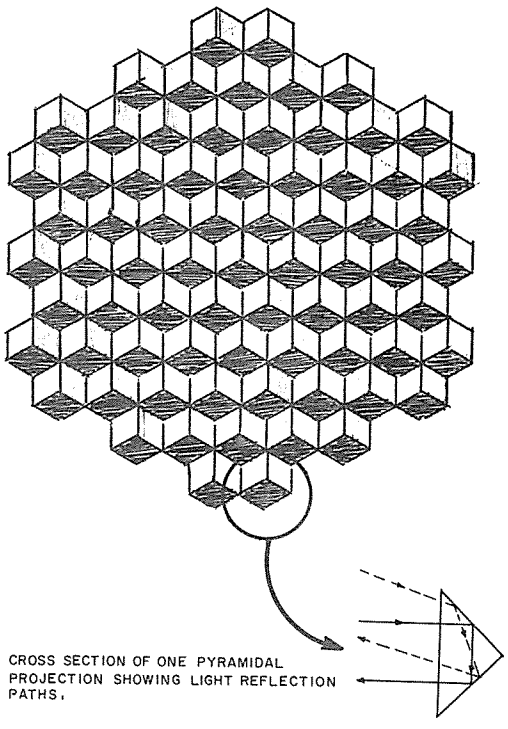
Test Set-up Using Two Collimators

Existing tubular collimators cannot be accurately or readily adjusted to simulate the required distance.

The development of the open collimator as an item of test equipment is proving to be of considerable value in all but field workshops. The open collimator permits accurate and rapid settings of simulated distances but it requires considerable straight line working space which is a disadvantage in mobile workshops.

One new technique called "autocollimation" is being applied to instrument testing on a limited scale. By mentally substituting 'self' for 'auto' we arrive at the term self-alignment which accurately states the principle of autocollimation.

One simple application of the principle of autocollimation is found in the reflector-type warning signals attached to automobiles or included in automobile tail lights. This type of warning signal reflects light with high intensity back to the driver of an approaching car. The high intensity reflection also occurs within wide limits regardless of the angle at which the light strikes the reflector.



Reflector-type Warning Signal

An explanation of this phenomenon will serve to explain the principle of autocollimation. Reflector-type warning signals usually comprise a piece of transparent moulded material, smooth and polished on one side while the other side consists of a multiplicity of small three-sided pyramidal projections. The three sides of each pyramid meet at an angle of 90-degrees while the axis of each pyramid is perpendicular to the smooth side. Light falling on the smooth side passes through, strikes the inner surface of a pyramid, is reflected at right angles toward another inner surface. It is then reflected from the second inner surface through a further 90-degrees and emerges from the smooth side travelling back in the direction from which it came.

The autocollimator is a universal piece of test equipment. It has certain testing advantages over the procedures now used:

a It is a selfchecking item of test equipment.

b Errors in horizontal and vertical planes can be accurately measured simultaneously.

c Optical systems not incorporating a reticle can be tested for parallelism with mechanical axis.

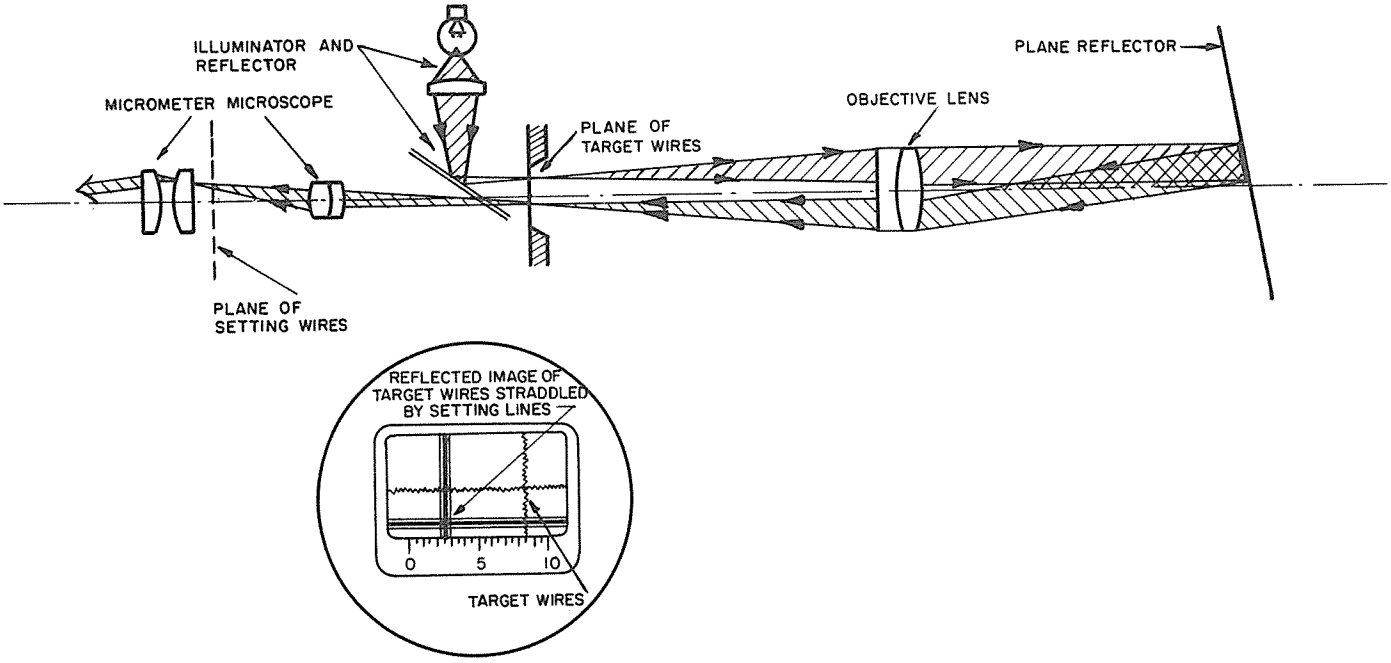
d Parallelism between two optical systems displaced from one another can be measured over a wider range than with present test equipment.

e It overcomes the problem of stability of mounting instruments and the use of precision adapters.

f It reduces the need to adjust collimators to simulated distances of less than infinity.

g Test set-ups using the autocollimator permit the use of the relatively compact arrangements required in mobile workshops.

The operation of the autocollimator is also very simple. It too employs the principle that a beam of light is turned through twice the angle at which the reflecting surface is tilted. The autocollimator generally comprises a telescope tube, an objective lens, a reticle and an eyepiece. The reticle is positioned in the



Optical System of a Typical Autocollimator

focal plane of the objective and may be readily examined by means of the eyepiece. An illumination system is included to light the reticle or a portion of the reticle.

Light from the illuminated reticle emerges from the objective lens as a parallel beam. After reflection from a plane surface the beam is received back into the autocollimator forming an image of the reticle in the same plane as the illuminated reticle. Small angles of tilt of the reflecting surface will produce a displacement between the reflected reticle image with respect to the reticle. The reticle pattern of the autocollimator may be graduated so that the angle of tilt of the reflecting surface can be directly read in both horizontal and vertical planes, by observation of the displacement of the image in relation to the reticle.

In order that an autocollimator can be used in testing optical systems it should have certain characteristics. It should have a parallel telescope tube throughout its entire length or be fitted with bearing rings. The optical and mechanical axes should be parallel. The illumination of the reticle should be variable to compensate for light loss in the optical system to be tested. The eyepiece should be of an adjustable focus type. The autocollimator should be capable of accurately measuring small angles by using a moving reticle and a micrometer adjusting screw.

To adapt an existing collimator to satisfy the above requirements it will be necessary to install a fixed and a movable reticle, a prism to illuminate the fixed reticle, a micrometer adjustment for the moving reticle and a suitable eyepiece. The major obstacle in adapting an existing collimator is in the micrometer adjustment of the movable reticle because the pitch of any micrometer adjustment screw is dependent upon the focal length of the objective lens used.

Trade pattern autocollimators are available which meet most of the requirements for service use. From personal experience it is known that the Taylor-Hobson Type 'B' autocollimator is one which is suitable for testing optical systems.

The autocollimator requires two accessories, not normally found in instrument workshops, to permit a full range of test set-ups. These accessories are a standard reflecting surface and an optical square.

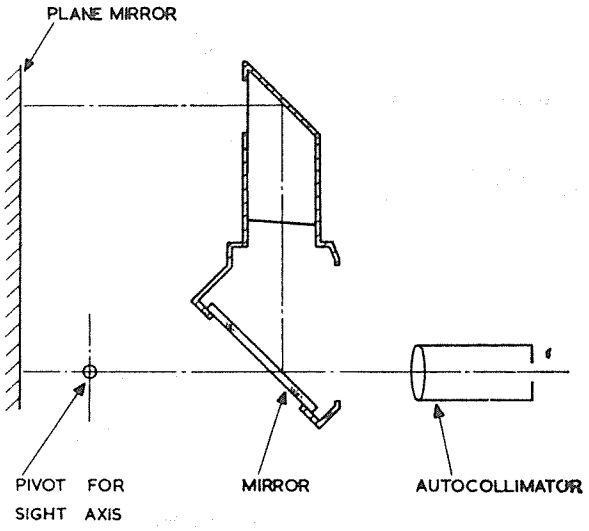
The standard reflecting surface should be a front surface aluminized mirror, approximately 12 inches by 3 inches by 1 1/2 inches

thick, flat to one wavelength of light and mounted in an adjustable holder. The holder should be capable of unrestricted movement in azimuth and elevation and should include a clamping device for each movement.

The optical square should comprise an accurate pentagonal prism mounted in an equally accurately machined cube. The optical square is required when testing parallelism of two or more reflecting surfaces to one another in both planes. It is also required when setting one reflecting surface at right angles to another reflecting surface in the same plane.

To test an optical instrument it is necessary to set up and accurately align the collimator and standard reflecting surface. The instrument to be tested is then interposed between the autocollimator and the standard reflecting surface. Errors in collimation are readily determined by observation of the relative positions of the reflected image and the fixed reticle.

Autocollimation is known to be of value in testing of periscopic types of instruments. Testing of the Sight, Periscopic, AFV, No 1, makes use of the autocollimation technique. The reticle of the instrument is illuminated and by means of an adjustable mirror, autocollimation is carried out without the use of an actual autocollimator.



Test Set-up Using Autocollimator and a Standard Reflecting Surface.

Additional new types of optical instruments will be introduced into the service in the future. The possibility of applying the advantages of autocollimation should be kept in mind when developing testing techniques for such new instruments.

RCEME FIELD UNIT (continued)

word, eg, "whiskey". The intruder must then reply with the counter sign or second part, eg, "sour". The sentry must not shout out the sign in case an enemy patrol is listening. Unobtrusiveness should be the aim of every sentry.

The above, as the title suggests, is based on practical experience. It may not agree with your ideas or experience. If so I would appreciate hearing from you through this Bulletin. I'm sure the editor will support you in this, and who knows, your embryo idea today may be the concept of tomorrow.

(We certainly do endorse the author's closing remarks. Indeed, we most strongly urge you to 'take pen in hand' and in a few words or many, let us have your 'embryo' ideas. All agree that the pam needs rewriting; your suggestions from practical experience may assist in the task. -Editor)

REME EXCHANGE OFFICER

Major ND Matthews is the newly-appointed REME Exchange Officer attached to Land Materiel Maintenance, HQ Materiel Command. He succeeds Major John Ingram-Cotton who has returned to the UK as Training Company Commander at Depot REME.

Major Matthews has just vacated the appointment of DADEME, EME 8, HQ DEME, where he served for two and a half years. Prior to this he served in HQ REME Corps Troops, British Army on the Rhine in Minden, West Germany.

Major Matthews is married, with three children, 11, 9 and 8.

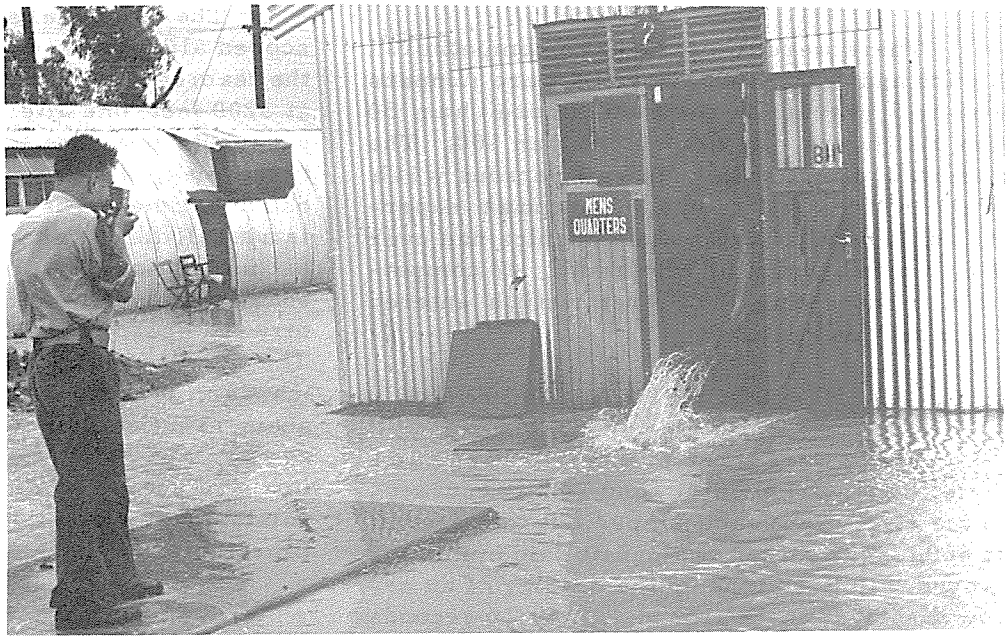
cyprus sports

Softball

On 26 Aug 66 the Canadian Contingent entered a team in the Little World Cup softball competition sponsored by the RAF Base, Permagos. Our team defeated all-comers including a strong US team. The RCEME members of the team are identified in the picture above: Front row 4 & 5th from left: Cfn White and Cpl Edmond; back row from left 1-Cfn Karu, 3-Cfn Cupples, 4-Cfn Vickers, 8-S s g t Bernard, 9-Cpl Fraser, 10-Ssgt MacDonald (coach)

Water Sport?

On 9 Sep 66 a 45-minute torrential rain and hail storm flooded the RCEME quarters to a depth of 9 inches. The lads are shown here bailing out.



CANADIAN PARACHUTISTS ATTEND BRITISH MEET

By Lt André Côté 2BN Royal 22c Regiment

Capt John Meek, an RCEME officer attached to 2 RCHA here in Germany and member of the Vandoo sport Parachute Club, won the Parachute Regiment Cup recently. This is for the highest scoring individual in the 1000 metre Individual Accuracy event in the British Army's annual Free Fall Parachuting Championships held last week at the Army Parachute Association Centre at Netheravon, England.

His victory follows closely that of the Canadian National Parachute Team who, two weeks ago, finished third behind Russia and Czechoslovakia in the VIII World Sport Parachute Championships held in Leipzig, East Germany. Canada won nine medals during the championships.

FIRST FOR FORCES PERSONNEL

This year's Army championships marked the first time that Canadian Forces personnel have been sent officially to a parachute meet. Until this year parachuting was not an authorized sport in the Forces. A team of five from 1 PPCLI consisting of team captain Cpl Gerry Vida, with Cpls Tom Holland, Brian Fulton, Russ Dickson and Roger Mayne competed in individual and team events. Capt Meek and Lt André Côté of 2 R22eR competed as individuals.

There were two classes of competitors, Novice and Advanced. Novices were jumpers who had previously completed more than 50 free fall jumps, but not more than 100. The advanced category included all persons with over 100 free fall jumps. The most experienced jumper in the championships had over 900 free fall jumps to his credit. 42 competitors representing 14 different units entered the meet this year.

TURNS AND LOOPS IN SPLIT SECONDS

There were three events: Individual style, Individual Accuracy and Team Accuracy. In the style event each jumper left the aircraft at 6600 feet between two panels laid out on the ground. He then took up the heading of an arrow displayed on the ground. After 10 seconds of free fall to allow speed to build up he began a series of predetermined manoeuvres using his arms, legs and trunk to deflect the airflow (eg, left turn, right turn, back loop, right turn, left turn and back loop). The jumper was watched from the ground through three optical instruments called telemeters and scored for the speed with which he completed the series of manoeuvres. He lost points at the rate of one point for every tenth of a second over 11 seconds for the series. He gained bonus points at the rate of one point for every tenth of a second under eleven seconds. The parachutist lost points for over or undershooting turns and for deviating from the axis of the arrow during backloops. The competitor lost all points if he opened his parachute before 25 seconds of elapsed free fall time or after 30 seconds.

Safety regulations stipulate that all parachutes must be fully open by 2000 feet above the ground. Each parachutist made two jumps in this event, attempting to get at least a perfect score of 250 points for each jump. The event was won by Rfn John Meacock, of the Queens Royal Rifles, with 499 points. He had turned the two series in 10.9 and 11.2 seconds.

MEASURED IN CENTIMETRES

The Individual and Team Accuracy were scored alike. The only difference was that in the team event a four man team left the aircraft at 3200 feet, one after the other, staggered the parachute openings to allow a good space between men, then they all headed for the target one at a time. The target in accuracy events is a small disk measuring 15 centimetres (about six inches) across. It is placed in a shock absorbing gravel or sand pit, because of the rapid forward speed of modern sport parachutes. The best competition parachute, the Paracommander, for example, glides through the air about 13 miles per hour, while its rate of descent can be as slow as 9 mph. Each competitor was scored on the basis that he lost one point, out of a possible 250, for every ten centimetres from the dead centre disk.

Each competitor in the Individual Accur-

acy event made six jumps, with the best five to count. The first round was won by a novice jumper, Sgt Daubney of the Twenty Second Special Air Services Regiment, with a 90 centimetre jump, giving him 241 points out of 250. Round two was won by Cpl Castree of Four Division Engineers, with a dead centre landing for 250 points. Round three was won by Capt Meek of 2RCHA, with a 21 centimetre jump for 247.9 pts. Rfn Meacock of the QRR won round four with an 85 centimetre jump for 241.5. Lt Cote of 2R22eR won round five with a 17 centimetre jump for 248.3. Capt Meek won again in round six with a dead centre and 250 points.

This event was won by Capt Meek who totalled 1181.2 points out of a possible 1250. Second place went to Rfn Meacock of QRR, with 1146.6 points. Third was Sgt R Griffiths of the Royal Green Jackets with 1136.6. Other Canadians who figured in the top quarter were: sixth Cpl Holland with 1113.1; eighth, Lt Côté with 1088.2; and tenth, Cpl Vida with 1068.7.

The Team Accuracy event was won by the First Battalion of The Parachute Regiment with a total of 1800.5 out of a possible 2000. The 1PPCLI team placed fifth in the event with 1515.6 points.

ARMY CHAMPION

The overall results, computed from the scores in all three events saw Rfn Meacock of the QRR win the title of Army Parachute Champion and win the Royal Artillery Cup. In the overall standing, Cpl Vida came out eighth, Lt Côté tenth and Cpl Holland eleventh.

OFFICIALS

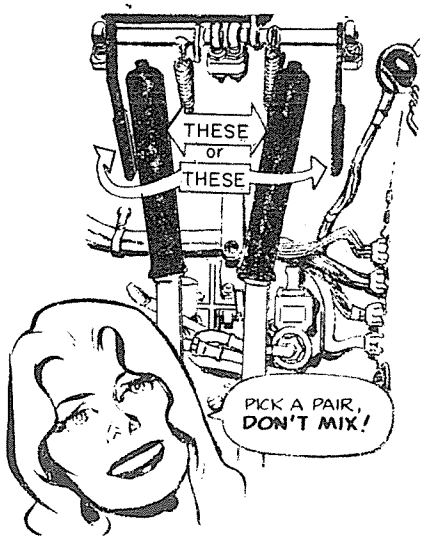
Championship Director and Safety Officer was Brigadier RD Wilson, MBE, MC, chairman of the British Parachute Association. All unit parachute clubs in 4 CIBG belong to the BPA.

Judges for the meet were members of the US Army Parachute Team, The Golden Knights, who were flown over from Fort Bragg, NC, and Ssgt M Turner who is Chief Instructor at the Rhine Army Parachute Association here in Germany. The Golden Knights are a full time unit commanded by a major. The team's tasks include free fall equipment research and development, tactical free fall missions, giving public displays and competitive jumping.

-The Beaver

See also page 39

STEER HANDLE HAZARDS



-PS Magazine

Double Trouble!

That's what a double set of steer handles can give you if you try to use both sets at once.

Either the pivot or regular steer on your M577A1 or M113A1 series vehicles will steer you right.

If you use both pivot and regular handles at the same time you can rip up some internal gears in your differential.

Remember it like this: Pick a pair (of steer handles) ... never mix 'em.

You use pivot steer for sharp, short, turns on land, for water operation or for emergency stops, but never use pivot steer if you are going over 10 mph or you'll damage your vehicle and probably yourself as well.

Technical Notes

Improvement to Working Conditions in Tels Test Cage

The Maintenance Technique Group, 202 Base Workshop, have developed a modification kit designed to improve the working conditions in test cages. The kit consists of a U-type or wrap-around work bench, shelving, fluorescent lights and an external ventilating fan. Its effectiveness was proven through a user trial at 207 Workshop, Kingston. Entitlement has been approved and the kits are being manufactured in quantity at 202 Base Workshop. Modification instructions detailing the kit installation together with cage disassembly, cleaning and reassembly procedures are now being processed.

NEW TEST EQUIPMENT

Electronic Multimeters

Multimeters to replace the Stark Models VT-9 and VT-9A have been, or are in the process of being, issued to RCEME units. The new multimeter is a Stark model 1604, catalogued as 6625-21-840-2039, Electronic Multimeter, ME-5012/U. It is to be held under existing entitlement to 6625-21-478-0516, Multimeter TS-505E/U.

The instrument has improved accuracy, frequency range and sensitivity. Initial user reports have been favorable; however, one cautionary word of advice appears warranted. This instrument, like others of its type, must not be used to measure commercial (AC mains) voltage without due regard to instrument ground relative to the grounded side of the AC line. Failure to do so may result in blown fuzes, damage to meter leads and a possible shock hazard.

RF Wattmeters, AN/URM-120

This new wattmeter has been in service for some months now and appears to be performing satisfactorily. Its ability to measure incident and reflected power from 10 to 500 watts over the frequency range of 2 to 1000 mc will satisfy most r-f power measurement requirements.

It is hoped that the confusion concerning entitlement to the instrument has been resolved. Initially and prior to issue RCEME units were granted separate entitlement to the wattmeter and dummy load. Subsequently the items were combined, recatalogued as 6625-21-117-1806 Wattmeter 120 W/E as per EIS 1465, and automatic issue made. Unfortunately, amendment to the entitlement documents was delayed which, for a time, resulted in confusion as to the total scale of issue.

Oscilloscope AN/USM-509

The issuing of the new oscilloscope, 6625-21-844-0147 Oscilloscope AN/USM-509, to RCEME units is nearing completion. This instrument, with its wide range (DC—25mc), dual trace capability, should be a vast improvement over the general purpose oscilloscopes previously employed. Again, the instrument is only as good as the operating technician and it behooves him to do some homework so that he can realize its full capability.

Frequency Measuring Set AN/URM (6625-21-114-7936)

Using the Model 607-24 Hetrodyne Converter as a Counter Pre-Amplifier in the E/UT Mode.

Technicians should, by this time, have had opportunity to study and use the new solid-state counter. The specifications are impressive and the instrument should prove an important addition to the test equipment inventory.

The discerning technician may have already noted the possibility of using the hetrodyne converter as a basic counter pre-amplifier. This fact, while not specifically pointed out in the manuals, becomes apparent upon reading the specifications and studying the circuit detail. The input sensitivity of the basic counter is stated as 0.1 volt, 1 volt and 10 volts, dependent upon attenuator setting, with input resistances of 20k, 200k and 2 meg respectively. The input sensitivity of the converter is stated as 100 millivolts at an input impedance of 50 ohms.

At first glance this would not appear significant aside from the fact that the 50 ohm impedance might be desirable for a particular circuit under test. Examination of the converter manual however, specifically Section 2.5.4,

reveals that the counter will function satisfactorily with converter inputs of less than 50 millivolts. This is due, of course, to the gain provided by the video amplifier and represents an appreciable improvement over the basic counter sensitivity.

Further study of the converter manual will reveal the use of 10 mc and 20 mc low-pass filters which must be considered in this application. The 20 mc low-pass filter is in the circuit at all times, the 10 mc filter is only operative when the converter is tuned to 30 mc or below. It follows that one need only tune the converter above 30 mc to disable the 10 mc low pass filter and the converter will then serve as a pre-amplifier for inputs at frequencies below 20 mc.

M113A1 and M577A1 APC
Ramp Hydraulic Cylinder Failure

There have been a number of failures of the ramp hydraulic cylinder reported to LMM. Investigation has established that the cause of most of them is the misalignment of the cylinder at time of installation.

Therefore, the following corrective action will be taken.

All vehicles on pre-issue check will have the cylinder alignment checked in accordance with the procedure detailed on page 266, TM 9-2300-224-20/2/1.

Similarly all vehicles now in use will have the cylinder alignment checked by unit vehicle technicians, following the above procedure.

DID YOU KNOW-

1966 Population (DBS)

Montreal	2,418,984
Toronto	2,145,637
Vancouver	884,095
Winnipeg	505,255
Ottawa	489,392
Hamilton	447,197

GOOD SHOW!

Cfn AG MacKinnon, 2 RCHA, was carrying out a routine periodic inspection on an L19E aircraft during a field training exercise. While visually inspecting the engine compartment for general condition, he noted a suspicious mark on the rearmost inboard portion of the motor-mount.

Cfn MacKinnon alerted the Sr NCO i/c of the inspection and the Ssgt Maintenance Supervisor. Using mirrors and jury-rigged lights, the team confirmed Cfn MacKinnon's discovery as that of a hair-line crack in the motor-mount. This discovery necessitated the removal of the engine and replacement of the motor-mount under field conditions.

Cfn MacKinnon showed alertness and professional care in this instance; his detection of such a crack is noteworthy. However, this is but half the story.

Four months earlier, Cfn MacKinnon had during routine maintenance, discovered a similar cracked mount which was so difficult to see that its full extent could only be appreciated after the engine was removed.

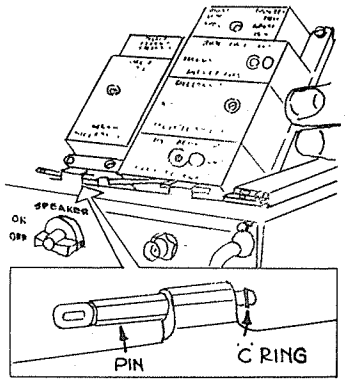
Cfn MacKinnon is to be commended on his thoroughness. His attention to detail and the manner in which he maintained his vigilance after one notable occurance are exemplary. It should be noted that Cfn MacKinnon performed these duties under far from ideal maintenance conditions.

GLEANED FROM PS MAGAZINE

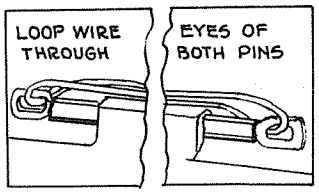
radio set AN/VRC-12 maintenance

The A8000 module board of the RT-524 has two hinge pins that you should not remove. Instead of swinging the board out of the way of the hinges, some Joes pop the C-rings on the hinge pins, remove the pins, lift the board out - and lose those tiny C-rings.

Naturally, they put the pins back in without the retainers, which gets deadly. The pins are free to work loose, fall in the gear train below, and cause the kind of damage that has your set out of action for a long time.



As a temporary fix (just in case somebody already lost your C-rings) you can loop wire through the eyes of both pins - or wrap fine wire in the C-ring groove and twist it.



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The K9002 relay in the A9000 assembly can play games with your set by sticking and keeping your transmitter keyed. Your clue that it's sticking is a blower motor that won't quit.

A 'sometime' cure is to remove the relay, give it a 180-degree turn and replace it. Otherwise install a new relay.

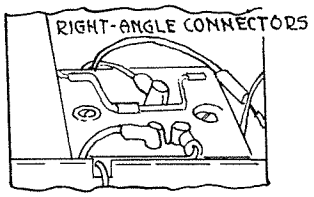
While you're waiting that minute or so for the PA tube of your RT-524 to warm up, don't let the cutting in of the squelch fool you. It's no indication that the PA tube is warm.

If you wait about a half minute after the squelch rushing noise stops, however, the tube should be warm enough to let you key the set.

Another indication that it's warm enough: the call light will stay bright when you key the set. If the call light dims noticeably stops keying. The tube's not warm, and you can shorten the life for some parts.

* * * * *

Have care with those small right-angle connectors inside the RT-524. Push them straight in and pull them straight out to keep from breaking or bending those small contacts.



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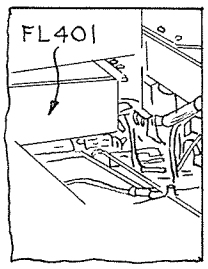
Also, when you replace the FL-401 filter in the RT's, don't force it into place. Be sure the lower connecting cable is in place before you lower the filter. Then, let the filter down with care.



If it doesn't slide down flush with the chassis, slip your finger under the filter and give the connector a slight clockwise twist. It should fall right in. But - don't force it!

While you're looking at the inside, stop at that green lead that runs from the FL-401 filter to the A8100 board. The A8100 is on hinges, too, and if you don't position the green cable carefully, you can break or bruise the cable and snap its connector by snagging it.

Same thing goes for the lead from the modulator assembly. The hinged board can snag the cable.

Also, those guards on the front panels of the main components may look handy, but they're not handles. If you want to head off a long repair wait for your set, forget about using them as handles. You can pull them right out of the panel.

MINOR COMPONENTS

The CX-4723 cable, which comes from the MT-1029 mount, attaches to the J501 receptacle of the AM-1780 amplifier only. Try putting it to the other receptacles and you might as well forget about using the amplifier for awhile. To avoid damage, mark the connector head with "J501" and the amplifier front panel next to the proper jack, with "J501".

Another must to prevent crossed-up cable damage is to keep the link in the MT-1029 mount in the remote position. Connect points E22 and E23 with the link.

* * * * *

Next time you lose interphone capability, try a couple of shortcuts before you suspect the A520 assembly in your AM-1780. Like suspecting your CX-4723 cables ... especially those coming off the receptacles of the amplifier.

Your trouble may just be a loose connection or a broken or bruised cable. A multimeter will tell you quick-like whether you've got an open circuit. It could save the time and trouble of replacing an A520.

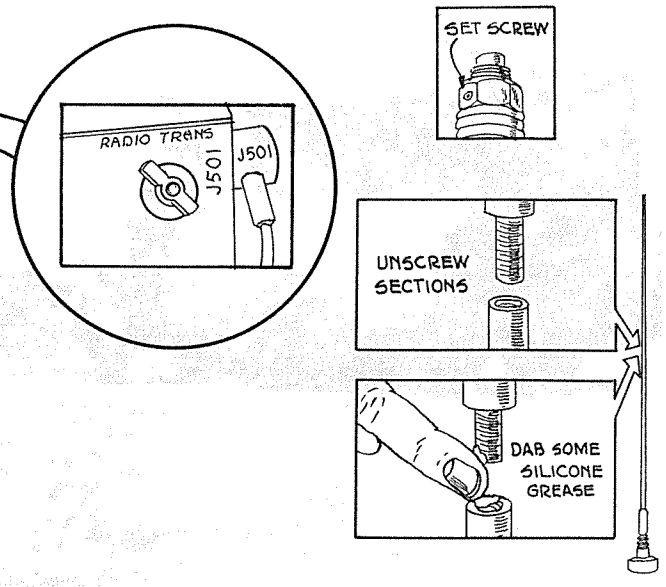
Finally, turning power off at the AM-1780 as well as the radio set(s) before starting or stopping vehicles is a "best" protection for the amplifier. To reduce damage from voltage surge or spikes a modification instruction will be introduced when mod kits are available.

ANTENNAS

The AB-719 set screws have a tendency to back out. Maintenance types can keep the screws from backing out with a dab of shellac or varnish.

If your AT-1095 and AT-1096 antenna sections are binding, about the easiest fix you can get is sympathy. It's natural for that material to bind, even when it's together only a short time.

There's no easy remedy, but unscrewing the sections about once a week (more often in damp areas) can help considerably to keep the sections from marrying up permanently. A dab of silicone grease on the mating ends also helps.



As a result of the exchange of a large number of amplifiers AM-1780, TFR's are still required on any failures experienced and it would help if the name of the manufacturer could be noted on the TFR.

Keep reporting with TFR's on any failures experienced with the VRC 12/GRC 125 family of radio sets.

RECONNAISSANCE DRONE AN/USD-501 (CL-89)

Test flights of the Canadian reconnaissance drone are proceeding at the Yuma Proving Ground, conducted by Canadian, British and West German army personnel.

The drone, designed to give field commanders a fast, automatic photo snoop behind "enemy" lines, is the AN/USD-501 developed and manufactured by Canadair Ltd, Montreal.

The trials troop, which includes five officers and 29 men of the Canadian Army, is carrying out service flight-trials lasting until the summer of 1967, probably followed by a short series of flights in the fall of 1967 at Shilo, Man, under tactical conditions.

It is a rocket-takeoff, jet-powered surveillance vehicle that travels near the speed of sound. It will fly over enemy territory and return to a field commander's headquarters with ground photographic information. The eight-foot, 200-pound missile-shaped drone has twin 70 mm cameras mounted in its belly that can photograph critical detail even at night by use of flares.

On completion of the flight, the photographic section of the drone troop processes the film and has it in the hands of the field commander in a matter of minutes. When top speed in intelligence reporting is paramount, the surveillance drone has the capability of automatically processing its own film while in flight.

Ssgt FH Weeks, RCHA, awaits the order to push the button that will launch the drone.

(DND Photo)

The RCEME members of the Canadian team are:

Capt	HG	Ray
WO 2	WN	Carefoot
Ssgt	TD	White
Sgt	FE	Arsenault
Sgt	AJ	Dawson
Sgt	DJ	Ward
Cpl	PA	Tardiff
Cpl	GJ	

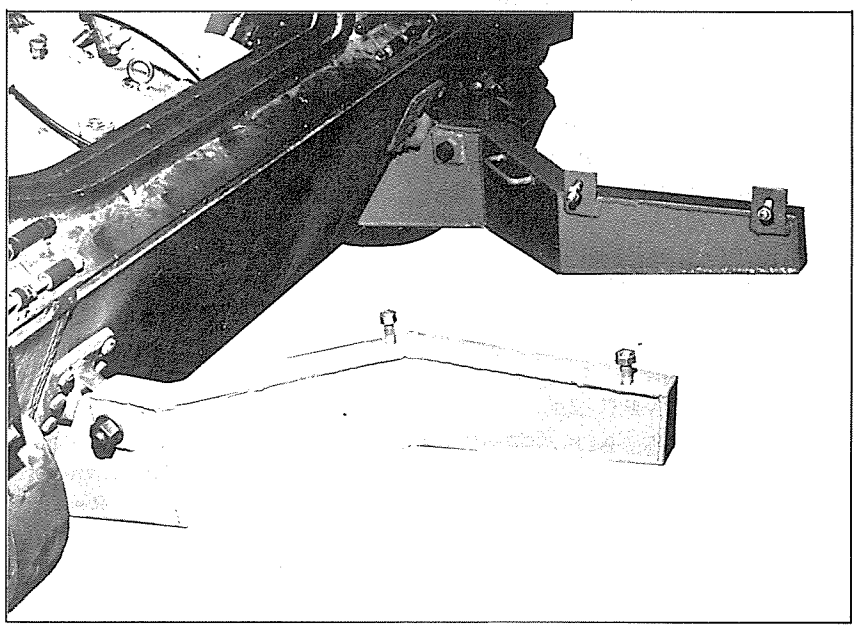
Lightweight Engine Stand

Based on a suggestion by Mr D. McIntosh of 27 COD, MTG London have developed a new portable engine stand capable of holding the M113A1 engine complete with transmission and transfer assembly.

Since this new stand is mounted on the front of the M113A1 Carrier and relies entirely on the carrier for support, there will no longer be a requirement for a hard and level surface, when it is necessary to remove an engine for repair. Also, the design of this stand is such as to afford easy access to all components of the engine. Because of its lightweight construction, 40 lb per arm, and relatively small size, 36 inches overall length, it is easily transported and can be installed by one man. Moreover, its rigid construction and secure mounting afford a greater degree of safety than most makeshift field arrangements.

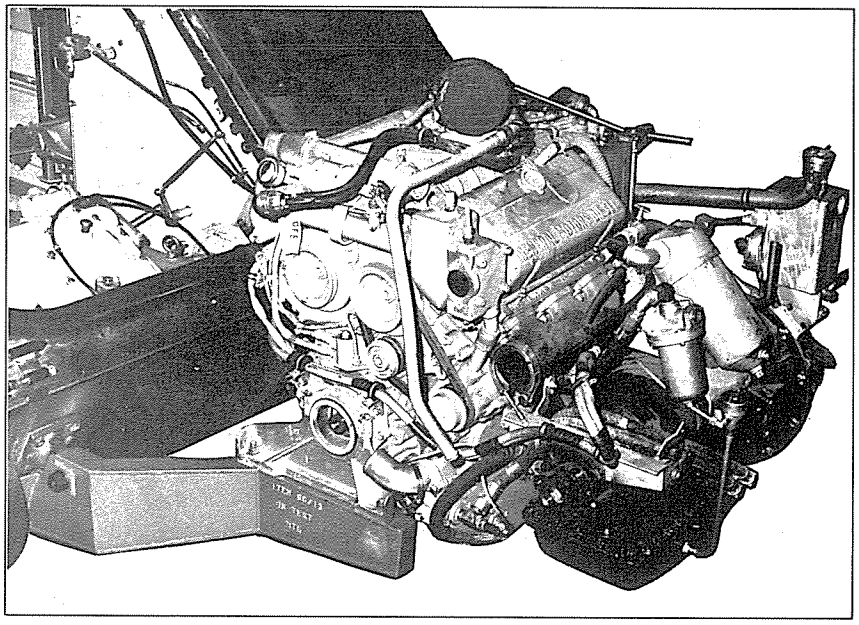
Although this stand was developed for use in field workshops, it is equally useful for any workshop. And it is less expensive and bulky than current field engine stands.

The stand will be manufactured using 3/16 inch structural steel plate and 3/16 x 2 1/2 inch mild steel flat strip from LMM drawings 800248, 800249, 800250, at a cost of approximately $75. These stands will be available to the field in the near future.



The two arms bolted in place on the front of M113A1

Complete engine with transmission and transfer assembly in place on arms



EME MANUAL ISSUES

The following EME Manual instructions were issued during Aug, Sep and Oct. Although these are notified in EME Manual General A 005 monthly, they are published here for general information.

Electrical A 000 Issue 12
Structure and Contents of Elec Part
Supersedes Issue 11

Electrical C 660 & 662
Public Address Set AN/TIH 502
Data Summary

Electrical F 904
Radio Set AN/VRC-24
Field and Base Repair

Electrical G 310, 313, 314
Radiacmeter, Gamma Survey IM-5016/PD
Data summary, unit, field & base repair

Electrical I 407 Instr 1
Radio Set C 42
Cleaning of L 40

Electrical K 629 Instr 1
Handset H-5003/PRC
Pressel switch.

Electrical K 774
Radio Control Harness Type A
Field & Base Repair

Electrical R 519 Instr 1
Distance Measuring Set AN/TRQ 501
Transformer replacement

Electrical N 687 Instr 1
Exploder, Dynamo, Condenser Mk 2
Mk 2 to Mk 3 changes

Electrical X 420/2 & 421/2
Power Supply PP-5143A/PRC
Data summary, and operating instruction

Electrical X 430/1
Power Supply, Electronic, Metallic
Data Summary

Electrical Y 140/24
Multimeter Electronic
Data Summary

Electrical Y 810/6 - 815/6
Oscilliscope AN/USM-507
Complete data

Electrical G100/1
Radiacmeter Technical Dosimeters
Tri-service data summary

Electrical G120
Detector Radiac Tactical Dosimeter
Tri-service data summary

Electrical G757 Instr 2
Radiacmeter, Remote Monitoring IM-5015/TD
Rewiring of battery-checking circuit

Electrical K 252 & 254
Power Supply, Electronic PP-5095/U
Description, field and base repair

Electrical K 454
Amplifier, Audio Frequency
Field and base repair

Electrical K 799
Amplifier, Audio Frequency AM-1780/VRC
Replacement of defective equipment

Electrical M 759 Instr 1
Radio Station C11/R 210
Installation in CPM577A1

Electrical O 614
Radar Set AN/MPQ-501
Field and Base Repair

Electrical Z 721/1 & 723/1
Test Equipment for AN/MPQ-501
Operating instructions and unit repair

Electrical G 759 Instr 1
Radiacmeter, Remote Monitoring IM5015/TD
Silicagel desiccators

Electrical K 452
Amplifier, Audio Frequency AM-5095/PRC
Description

Electrical L 149 Instr 1
Installation of Radio Station AN/VRC-24A in Trucks M 38 and M38A1

Electrical W 729/2 Instr 2
Periscope, Infrared M19
Differences in two models

Electrical Y 312/1
Calibrator Set Radiac AN/VDM-501(V)
Additional page (9)

Engineer Equipment I 130
Loader, Scoop-type
Data summary

Instruments B 442
Sightunit 84mm Mk 1
Description

Management H 551
Condemnation of Stores & Eqpt
Amendment to condemming authority

Management H 560
Destruction of Military Tech Eqpt

Management H 700
Backloading and Reallocation
Amendment

Management L 105
Dealers Estimate and Work Authorization Order
Amendments

Misc Eqpt O 305
Joyce Hydraulic Lift L 2T
Adapters for various eqpts

Misc Eqpt O 321
Attachment, Tire Bead Breaker

Misc Eqpt O 385
Metal Spray with Oxy-acetylene Torch

Vehicles A 614 Instr 1
Trucks and Trailers SMP
Repair of frames

Vehicles J 289 Instr 34
Tank Medium Centurion Mk 5
Modification to turret ring bolts

Vehicles L 107 Instr 1
Carriers, Full Tracked Armoured M113A1
Clearance lights and turn signal lights

Vehicles L 107 Instr 3
Carriers Full Tracked Armoured M113A1
Transfer case oil dipstick

Vehicles N 027 Instr 54
Car Armoured Ferret Mk 1
Steering stops

Vehicles T 007 Instr 4
Trailers 2 Wheeled SMP
Installation of turn signals

Vehicles T 319 Instr 6
Welding Trailer 1 1/2 ton 2 Wheel
MIG welding equipment

Vehicles X 004 Instr 2
Engines
Serial numbers

Vehicles X 005
Engines
Breaking in of new & rebuilt

Vehicles Z 030 Instr 10
Automobile, Sedan, 6 Pass
Data summary (Chev 66)

Vehicles A 761/1
Sedans and S/wagon Tires & Tubes
Care and Maintenance

Vehicles J 289 Instr 33
Filter Unit M8A2
Installation on Centurion Tank

Vehicles N 029 Instr 10
Filter Unit M8A2
Installation on Ferret MK 1

Weapons G 133 Instr 1
106mm Rifle M 40A1 & Mount M 79
Unit repair

Weapons C 829 Instr 7
Rifle 7.62mm FN C1A1
Adj to lever locking catch

Weapons C 829 Instr 8
Rifle 7.62mm FN C1A1
Repair to leaf backsight

Weapons E 119 Instr 4
Rifle, Auto 7.62mm FN C2A1
Adj to lever locking catch

(Continued on page 20)

FLUIDICS: NEW SCIENCE PARALLELS ELECTRONICS

THIS OLD ART IN MODERN GARB IS DOING THINGS WITH FLUIDS AND GASES AS SOURCE OF ENERGY

A new technology called fluidics is developing along parallel lines to the science of electronics. It does some of the things electronics does — but uses liquids or gases instead of electricity as the energy source.

Fluidics, like electronics, can be used to control processes, sense changes in environment, and amplify energy. And, again like electronics, there are no moving parts.

Although not an entirely new art — basic studies were done more than 30 years ago — commercially practical applications have become possible only recently.

In Canada, the new technology has been pioneered by Aviation Electric Ltd., Montreal, and the firm has developed several systems and components.

Fluidics uses a fluid with low energy to control a fluid with higher energy. It's done through the interaction of flows and pressures in different components. The principles of hydraulics and pneumatics can be duplicated in fluidics. Pressure applied to a fluid at one point in a system results in a higher pressure at another point. A variation in input velocity, position, temperature or acceleration of the fluid at another point in the system is converted to fluid signals at other points that apply force, amplify energy or switch fluid energy from one channel to another. This is something like the work of an electronic component.

A fluid amplifier, for example, in which low-energy fluid controls higher-energy fluid in a no-moving-part device, may be compared with an electronic vacuum tube in which electronic energy is controlled as in a valve.

Fluidic components are made from plastics and connected by plastic or metal tubing. The components are exceptionally resistant to severe vibration, shock, nuclear radiation, explosions and temperature extremes.

Switches, proportional valves, oscillators, signal generators and various types of amplifiers are produced for fluidic circuits.

Fluidics is used in the aero-space industry in Canada. High-altitude sounding rockets use a fluidic system to release streams of trimethyl aluminum which are observed from the ground to determine wind shear and direction.

Other applications are automatic flight controls, machine-tool control and gas-turbine control systems.

Fluidics is already an estimated $15 million- $20 million industry in the U.S. and is expected to reach a $200 million volume by 1970.

-Financial Post

EME MANUAL ISSUES (continued)

Weapons R 504
Howitzer 155mm M1A1 Cdn
Field and base repair

Weapons U 100
Gun 105mm Tank L 7A1
Data summary

Weapons G 134
106 mm Rifle M40A1 and Mount M79
Field and Base Repair

SENIOR STAFF OFFICER CATALOGUING

Before integration each service was operating independently on the NATO cataloguing system: DMST (NAVY), DCER (ARMY) and SOMIC (RCAF). In June 1965 they were integrated under the Senior Staff Officer Cataloguing (SSOCatalogue) Materiel Command. RCEME is represented by Capt RH Purton.

CATALOGUING SERVICES PROVIDED BY SSOC STAFF

Through constant and close liaison with the Services supply elements the SSOC staff provides day to day cataloguing support for the Canadian Forces such as:

a. Screening and cataloguing of all new items entering the Services supply systems;

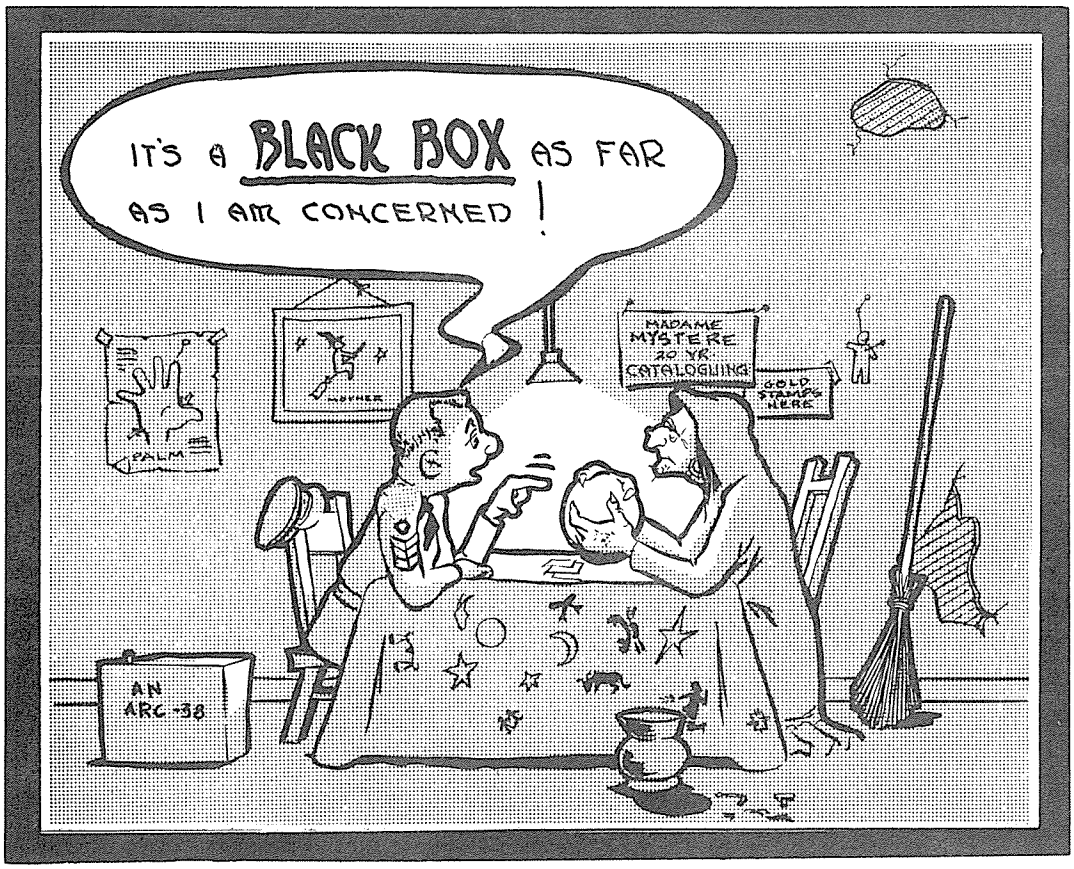
b. Introduction and promulgation of all changes affecting catalogue information;

c. Preparation of item identifications for descriptive type items and production and distribution of Canadian Item Identification Cards;

d. Recording and promulgation of reference type items;

e. Preparation and promulgation of cataloguing publications to meet Service requirements, including:

EDP produced catalogues,
Descriptive class catalogues,
Supply Manuals and Supply Lists,
Master Reference Number Indexes.



In addition the SSOC staff carry out the functions of a National Codification Bureau in Canada which include:

a. The registration and assignment of NATO Stock Numbers in the (21) Canadian series to meet all Canadian requirements.

b. Maintenance of central cataloguing data files for Canadian items of supply catalogued under the NATO System.

c. Liaison with other national codification bureaux on projects of joint interest.

d. Cataloguing on behalf of other NATO countries of military equipment procured in Canada.

e. Providing representation at meetings of the NATO Panel on Codification of Equipment and Sub-Panels as required.

The prime objective of the NATO Cataloguing system is to increase military effectiveness by promoting greater efficiency in supply operations. For each item of supply it provides the NATO countries with a single name; unified stock number; a single uniform classification and identification.

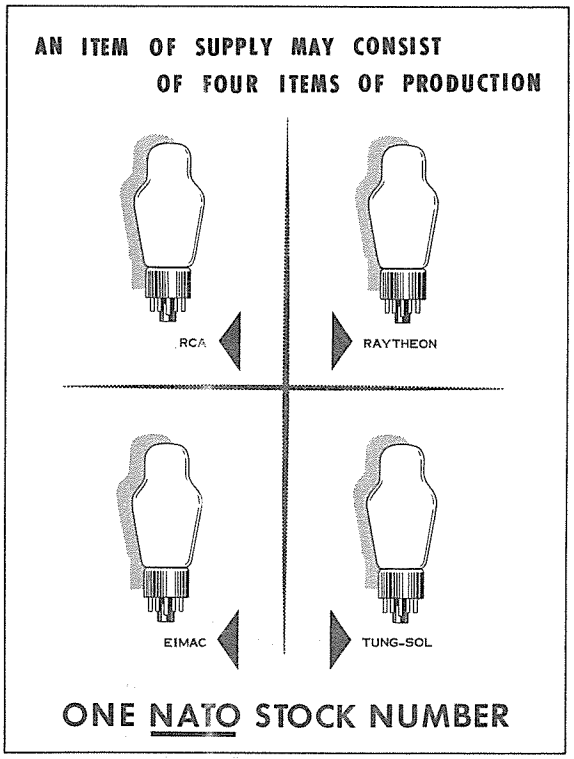


Figure 3

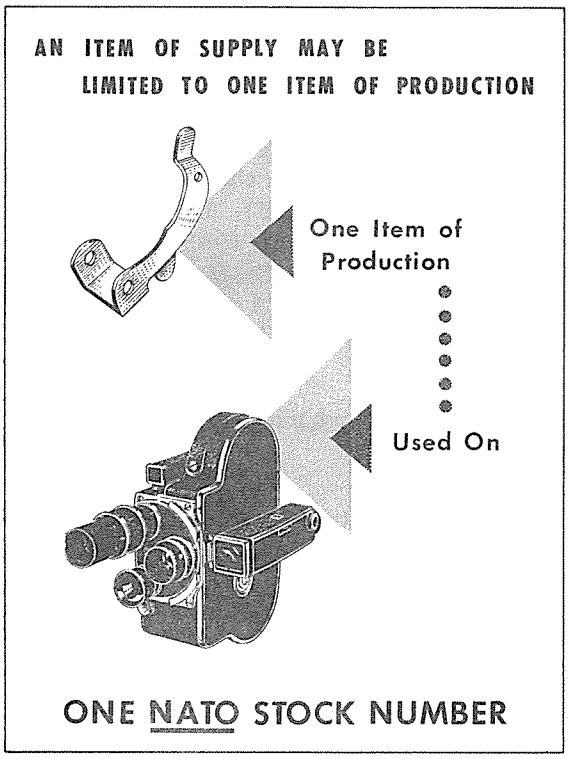


Figure 2

THE ITEM OF SUPPLY CONCEPT

In order to explain the Item of Supply Concept as used in the NATO Cataloguing System two terms, frequently referred to, are defined as follows:

a. An ITEM OF PRODUCTION is a component, sub-assembly, or assembly produced by a manufacturer, supported by the manufacturer's or designer's part or drawing number and conforming to the same engineering drawings and specifications, and subject to the same quality control and inspection. All items included in a manufacturer's or designer's schedule of parts or item lists can be considered items of production.

b. ITEM OF SUPPLY. The supply concept of an item is determined by the

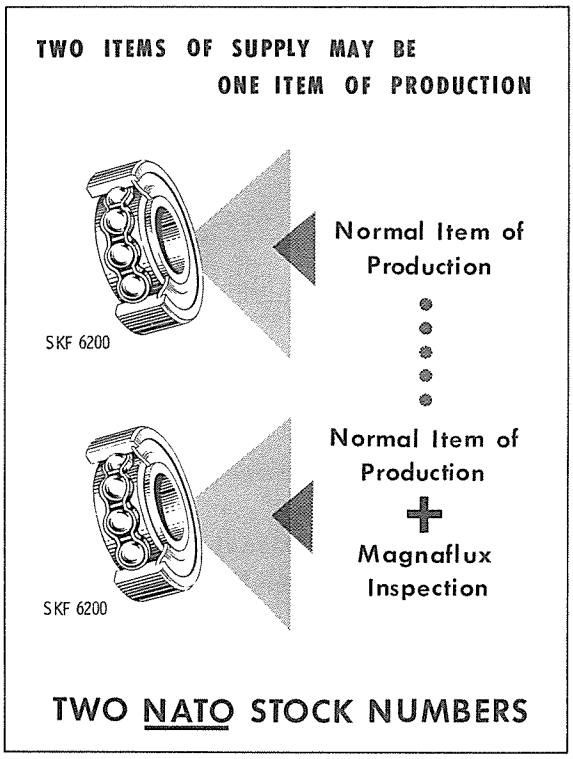


Figure 4

operational and supply support requirements of a supply system and is reflected in the item identification. Within the limits and tolerences specified in the item description, an ITEM OF SUPPLY can be:

(1) a single item of production;

(2) two or more items of production which are interchangeable;

(3) a more precise quality controlled item than the normal item of production;
(4) a modification of a normal item of production.

This means that a single item of production of a single manufacturer may be an item of supply and have assigned to it a single NATO Stock Number; or one or more items of production of one or more manufacturers, may constitute an item of supply and have a single NATO Stock Number. A more precise item of production, such as a close tolerance item, selected from a normal production run may be an item of supply, having its NATO Stock Number, while the normal item of production, from the balance of this or other production runs, may also be an item of supply having another NATO Stock Number. Various operational requirements in the different supply systems may cause an item of production to fall validly within more than one item of supply concept with more than one NATO Stock Number.

An item of production of one manufacturer will not be brought together with the item of production of another manufacturer as a single item of supply unless the physical, functional and performance characteristics of both are suitable for use in all intended applications. Even then, if two items of production are interchangeable as assemblies, and one or both require spare parts support where spare parts are not fully interchangeable, these items will be considered to be different items of supply and accordingly have different NATO Stock Numbers. Proprietary items frequently fall within this category.

Only items of supply, as determined by an appropriate authority, will be NATO catalogued.

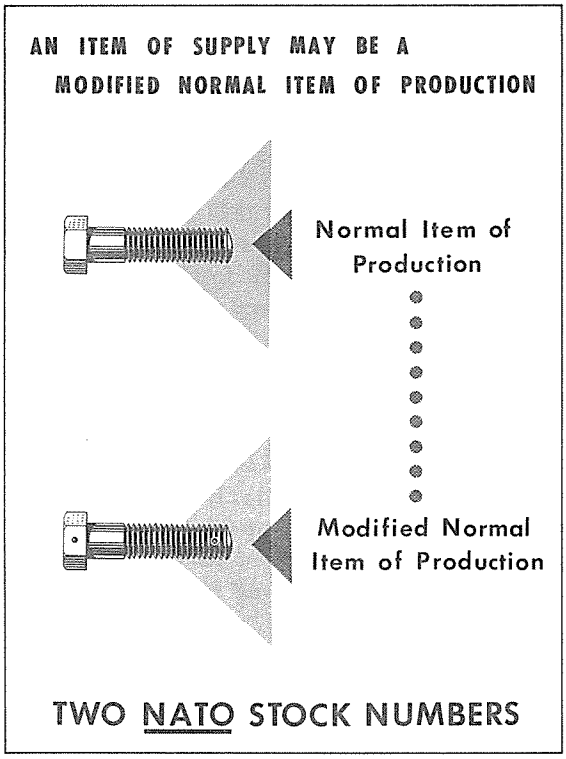

AN ITEM OF SUPPLY MAY BE A
MODIFIED NORMAL ITEM OF PRODUCTION
Normal Item of Production
Modified Normal Item of Production
TWO NATO STOCK NUMBERS

Figure 5

EXAMPLE OF A NATO STOCK NUMBER

99	99	21	999-9999
group	class	nation code	national item identification number

9999	21-999-9999
Classification	NATO Item Identification Number

9999-21-999-9999
NATO Stock Number

THE NATO CLASSIFICATION SYSTEM

The vast numbers of supply items necessitates the breakdown of materiel into manageable segments for family grouping or classification.

In the NATO Codification System, there is a uniform system of classification so devised that no one item should be classified in more than one class - there is no overlapping. The class of an item is indicated by a four-digit number (e.g., 5305); not three digits, not five digits, but always four. This is not a hardship; if we start with class 1000 and finish with class 9999 we have a potential of 9000 different classes in which to "pigeon-hole" our various kinds of stores, ranging from Guided Weapons to Army great-coats. In actual fact it has been found that at present there is a need for a mere five hundred or so separate four-digit classes to segregate the diverse and comprehensive ranges of stores within the coverage of the NATO Supply Classification structure. Each class is related to a parent group denoted by the first two digits of the complete four-digit class code. Thus class 5305 (screws) is related to group 53 (hardware); class 8430 (men's-footwear) is related to group 84 (clothing). The groups are evenly dispersed in the structure, starting with "group 10" and finishing with "group 99".

NATO STOCK NUMBER

Having established the uniqueness of an item of supply through a NATO item classification and identification, the identity of the item is fixed and its relationship to other items is established through the assignment of a NATO Stock Number.

The NATO Stock Number is a thirteen digit number consisting entirely of numerals and is divided into three parts.

The first four digits are the classification code detailed above showing the relationship to other items. The classification is internationally recognized.

The next two digits indicate the country assigning the item identification number. In certain cases an "11" in this place indicates a NATO common item.

The final seven digits of a NATO Stock Number are non-significant. This number forms the national identification number of a particular item and is assigned to one and to only one item of supply. This number remains with the item as long as the item exists, even though the classification number is changed through reclassification. These numbers are held by the national codification bureaux of each country.

National item identification numbers are always written for clarity of identification, with hyphens between the third and fourth digits.

The NATO stock numbering system provides salient advantages such as:

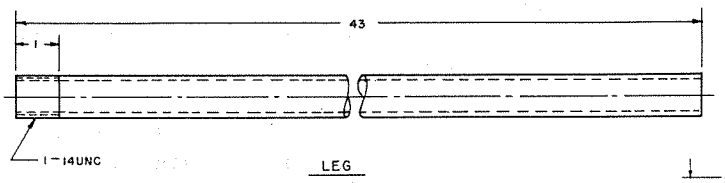
a. Uniformity: in structure, composition, length and use.

(Continued on page 25)

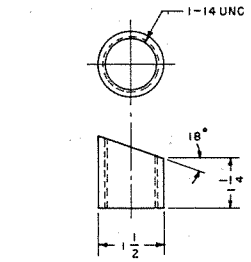
Aluminum Test Stand

A suggestion has been submitted for the fabrication of a collapsible aluminum stand to be used when testing instruments with a very sensitive compass needle. This stand can be dismantled for stowage.

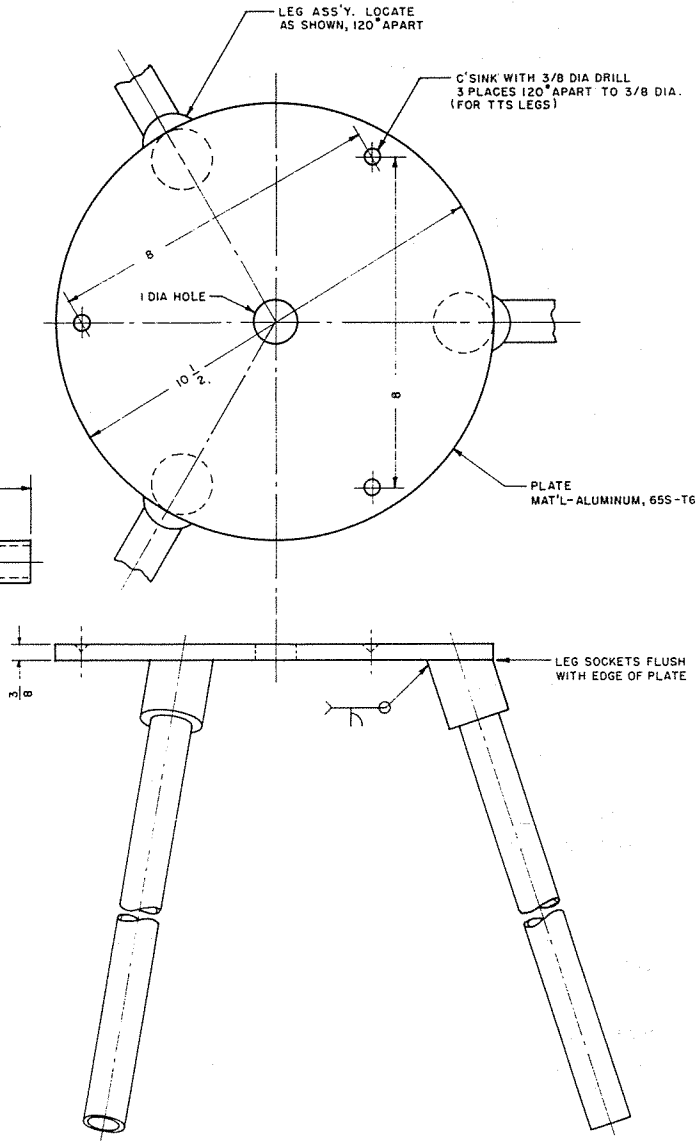
As it is not proposed to catalogue this stand, any workshop may manufacture one under authority of EME Manual Management H400.



LEG
3 REQ'D
MAT'L - 1" O.D. 65S-T6 ALUMINUM TUBING
WALL THICKNESS .120



LEG SOCKET
3 REQ'D
MAT'L - 1 1/2 O.D. 65S-T6 ALUMINUM BAR


LEG ASS'Y. LOCATE AS SHOWN, 120° APART
C'SINK WITH 3/8 DIA DRILL 3 PLACES 120° APART TO 3/8 DIA. (FOR TTS LEGS)
8
1 DIA HOLE
10 1/2
8
PLATE
MAT'L-ALUMINUM, 65S-T6
3/8
LEG SOCKETS FLUSH WITH EDGE OF PLATE

DEME 800254

SSO CATALOGUING (continued)

b. Stability: the item identification lives with the item forever.

c. Adaptability: the NATO Stock Number serves differing needs of supply management and operation. It is readily adaptable to mechanical and electrical data processing equipment.

d. Simplicity: applicable without modification to all items, easily maintained and easily recognized.

Contracts for military equipments to be supplied to NATO or other foreign countries require that the equipment and all supporting spare parts supplied are codified to the NATO system.

PLANNING AHEAD

A programme for the rationalization and refinement of the integrated cataloguing records is proceeding. Development of improved data processing methods to enable automated processing of the mass of cataloguing data involving millions of records is under constant study.

The aim is to provide more efficient and more responsive materiel cataloguing service to all supply activities.

Writing Manuals may be your next job !

By Murdoch Adamson LMM/Mat Comd HQ

Instruction manuals are the main means of communication between the equipment builder, designer or Technical Authority and the user. And the more complex the equipment, the greater the writing task in preparing the manual. If you plan to stay in the RCEME Corps you are almost certain to run into an instruction-manual writing job. Let's take a look at some typical manuals and see how they're written. You'll also learn the best ways to write a manual yourself.

What is an Instruction Manual?

Most instruction manuals tell the reader how to do things - install an equipment, maintain a machine, operate a weapon, etc. These manuals give specific how-to instructions. Relatively little theory is covered. The reason why theory is given less attention than other phases of the subject is that instruction manual readers want quick answers to practical problems they meet.

Users of instruction manuals are often technicians, mechanics, or operators, some of whom may be highly trained while others may never have seen the equipment before. So the instructions must be clear, concise and accurate. Remember - the instruction manual you write may be used on an arctic mountain, in the desert, or in the back of some SMP vehicle in the jungle. Your readers will believe and apply every word in the manual. You must be precise, exact and above all, clear. Instruction manual writing demands that you continually put yourself in your reader's place. Only then can you anticipate his questions.

Typical Instruction Manuals

We haven't space here to reproduce an entire instruction manual. But the following paragraphs, chosen from typical EME Manuals, will show you the style of writing used today. Note that all the instructions are specific. They tell the reader what to do, how to do it, when to do it, and why to do it. Only when you aim at a clear, concise explanation of the job can you expect your reader to understand you.

Automatic Remote Rebroadcasting

4. A vehicle Radio Station C42 and a portable Radio Set AN/PRC - 509 or 510 - may be connected together so that traffic received on one set can be transmitted simultaneously by the other. Fig 1 is a block diagram of such a facility showing the two outstations, the two radio stations and the Control Radio, C-5094. Connecting up and operating the stations is detailed hereunder.

5. Set up the parent radio stations in accordance with the appropriate Operator's Handbooks.

6. Separate the frequencies of the nets, F1 and F2 by at least 1 mc; they must be free from mutual interference.

7. Establish reliable communications on nets F1 and F2 prior to connection for rebroadcast operation.

8. Connect Radio Sets No 1 and No 2, etc.

9. Set Junction Box J1 for remote rebroadcast as shown in EME Manual Electrical K761, para 24.

Note that the operator is told exactly what to do. On half the pages of this Manual (Elec K781), both line drawings and half-tone illustrations show the reader how to do his job. So if you want to be a good technical manual writer, you must not only tell the reader what, how, when and why. You must also SHOW the reader. Specific how-to text and clear working drawings and photos are your key to successful writing of technical instruction manuals.

Now let's look over portions of two other well written manuals:

Battery Replacement (See Fig 2)

5. The batteries of the amplifier are replaced as follows:

(a) Remove the screw cap from the control panel.

(b) Withdraw the brass battery tube.

(c) Remove old batteries and install four D-Cells, observing the polarity as marked on the battery tube.

(d) Replace the battery tube into the set and tighten screw cap firmly.

(e) Check the operation of the batteries by turning the power supply ON-OFF switch to the ON position. The send-receiver relay should click when shorting the TEL terminals.

Opening the Equipment

6. (a) The amplifier may be opened by removing the four socket-head cap screws in the corners of the front panel and pulling back the case.

(b) If the seal between the case and the front panel, etc.

Magazine C1

24. Grasp the magazine in the left hand, bottom side up and the rear toward the right, placing two fingers over the bottom plate to control the spring. Insert the nose of a round or the point of a small tool into the notch provided (Fig 10) and while raising the bottom plate, slide it rearward far enough to clear the retaining lugs. Continue the rearward motion of the plate with the fingers of the right maintaining firm control of the spring with the two fingers of the left hand (Fig 11). Remove the spring assembly from the case.

Magazine C1A1

25. The bottom plate of the C1A1 magazine is retained by a detent, etc.

These two examples (EME Manuals Electrical J143 and Weapons C823 Instr 1) show good use of subheadings. You can make an instruction manual easier to use by inserting subheads where they will help the reader. Use the main subject of a paragraph for a subhead. Try to keep the subheads consistant. For instance, when writing about the components of a machine, use only the part names as subheads. Thus in a manual on motors, you might use the following subheads: "Shaft", "Bearings", "Frame", "Armature".

When discussing operating procedures, choose appropriate words. Typical ones might be: "Greasing", "Oiling", "Starting", "Stopping". Do not combine words from the component section with those in the operating section unless they are related. If you must combine the words from the two sections in the operating section, do it this way: "Oiling the shaft", "Greasing the bearings", etc. Handling your subheads this way helps the reader understand the instructions and makes them easier to use.

Trouble-shooting tables find a use in almost every instruction manual, for they tell the reader exactly what to look for when trouble develops. Even if your reader does not find the trouble through the items you list, he'll have a good chance of finding it in related items.

If you are not very familiar with the machine or device you're writing about, get expert assistance when preparing trouble-shooting tables. Have one or more mechanics list the troubles they've met and try to classify these troubles under a few major causes. If possible, ask the design engineers to do the same. Classify all these troubles. Then have them checked out by both the mechanic and the engineer.

How to Organize the Writing Job

Preparation of instruction manuals can rarely be done satisfactorily if assigned to an individual in the engineering department in addition to his regular duties. Besides the time involved, close association with the equipment often prevents the objective viewpoint needed in writing for a different level of technical knowledge or aptitude. The task should be performed by competent technicians and illustrators employed as writers.

You must make a comprehensive analysis of the job before starting work. Here are seven pre-writing steps:

a. Determine the requirements. If you have any questions concerning what is to be done, or how, ask them at once - not later.

b. Gather all the available source material. Include all applicable specifications and up-to-date equipment data. Arrange your material in an orderly manner for easy reference.

c. Read and understand clearly the specifications set up for your job. You can avoid costly errors by understanding the 'specs' from the start.

d. Study the equipment. Prepare a systematic breakdown of the assembly and subassembly components. Make certain that your analysis of the parts is in keeping with the specs governing the job. You'll find it is usually a good idea to check the parts list first, since the parts information is needed for writing the other material. And do not overlook the supplementary equipment like accessories, test equipment, special service tools and connecting cables. Your component breakdown not only helps you establish a presentation sequence - it also helps you in making a comprehensive evaluation of the job ahead.

e. Prepare a detailed outline. Like any other writing job, a good technical instruction cannot be written without an outline.

f. Check with your supervisor. He'll welcome a chance to discuss the manual before actual writing starts. These discussions will always save time, money, trouble and energy.

g. Establish a schedule and a budget for your writing. The schedule sets a series of checkpoints for evaluating progress. Assign target dates for the completion of each phase so that the final target date will be met. Include a time factor in the schedule for the unforseen developments that always happen.

(This is the first of two installments; the second will deal with writing and illustrating and use of a check list. Watch for it in the Jan 67 issue.

We commend the above to your attention and study. Whether you are (as the author states) predestined to write instruction manuals or whether you'd simply like to write technically about your job, these notes will help.

As usual we'd like comments. If the response is favorable, we plan to write a revised version into the EME Manual. Editor)

BEST IN THE WEST

Possibly you missed a recent CP News story on Canada's Alouette 1 which is still "singing like a lark" after circling the globe for 4 years. It has made 19,951 orbits of the earth.

Dr AH Zimmerman, Defence Research Board chairman, reported: "The Americans have acknowledged that Alouette 1 has the best test and flight record of any satellite in the West. And I'm damn sure the Russians can't top it."

The solar cells of the battery driving the transmitter are still operating at 35 percent efficiency after 4 years steady work of sending space information to earth.

"The machine gun will never stop the horse".

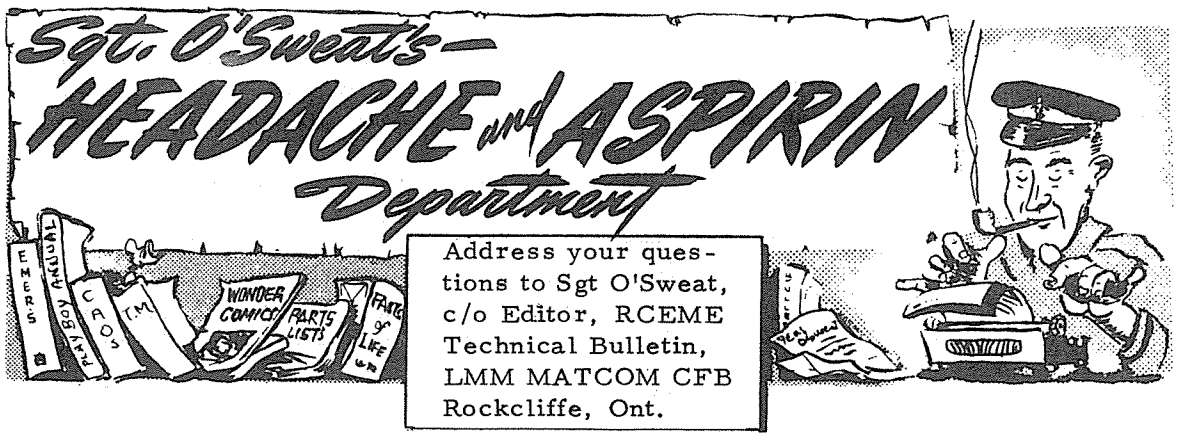
Haig

"Enemies likely to be dangerous are always too cunning to expose themselves to danger".

Napoleon

"The best executive is the one who has sense enough to pick good men to do what he wants done, and self-restraint enough to keep from meddling with them while they do it".

Teddy Roosevelt



Dear Sgt O'Sweat;

Our standard commercial spare parts supply in Maritime Command (Pacific) is through RCN sources. Their standard commercial engine replacements consist of a short block assy purchased through local contract. With the exception of Ford, these are not serial numbered and therefore cannot be recorded in the history log or on copy four of the 2149.

Does a short block assy constitute an engine replacement for our records or could it be classed as a repair?

(J D Dunsmore) Sgt
217 Workshop

Dear Sgt Dunsmore;

This is one that had escaped our experts and they are very pleased to have heard about the problem from you.

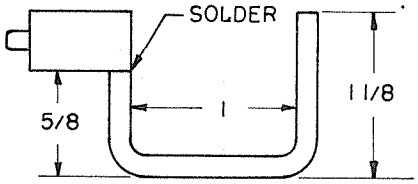
EME Manual Vehicles X 004 Instruction 2 is being amended to direct that the serial number of the non-serviceable block will be stamped on the replacement block, prefixed by the replacing workshop number. The example they show reads 508/54650. In cases where the short block assembly already has a serial number the workshop number will also be added as a prefix. In both cases the new number will be recorded in the log book.

Too bad you can't come up with a good one in the depth of winter so I could have an excuse to come out there and view the problem on the ground.

Sgt O'Sweat

Dear WGS;

Although I'm quite sure you are clever enough to have completed the interim repair to the quadrant sub-arm suggested in the July 66 Tech Bulletin, I am now including the 'as shown' for the benefit of others not so sharp.



Sgt O'Sweat

Dear Sgt O'Sweat;

As maintenance section contract NCO, I am expected to be the base expert on contract EME Manual Instructions Management L 101 to L 105 and L 107.

It seems that the above instructions are out of date. For example, they still refer to the old geographical command appointments and the old method of obtaining Primary 79 funds. We are also now responsible for repairing some Air Force vehicles and we are not sure whether we should be using Management L 105 procedure or the Air Force procedure for DEWAO repairs.

As I hear by the grapevine that you, Sgt O'Sweat, were on contracts some years ago, your advice would be much appreciated.

Cpl L Lessum
CFB Utopia

Dear Cpl Lessum;

There's been much water under the bridge since I was on contracts but our LMM contracts people tell me that you are not alone in your confusion. They also!

Through various messages and letters and some formal amendments they have tried to keep you up to date on major changes. However, you are quite correct in pointing out that the instructions still refer to the old command appointments, and we can only say that the instructions are unlikely to be rewritten until we become more integrated in Materiel Command.

As you know, your contracts fall into two main categories, which we have for many years loosely referred to as Primary 79 and DEWAO. The only real change in Primary 79 is the use of omnibus financial incumbrances provided to the local treasury offices. This is actually an advantage over the old method.

But the DEWAO is a horse of another colour. For the remainder of this year at least we will have Army and Air Force contracts. For this reason we would prefer to use the RCEME procedure for army vehicles and RCAF procedure for air force vehicles. However, this is only an attempt to preclude running out of funds in one or other of the contracts.

If the large percentage of vehicles on a base are army (or air force) there is no real objection to using either RCEME (or RCAF) procedure for repair of all vehicles. However, do not mix the procedures on the same DEWAO. For example, the control number is important to our procedure and the CD number is important to Air Force, so use either the one or the other procedure.

Meanwhile our contracts people are working with CFHQ and RCAF on a common procedure which we hope will be published before long.

These are trying times - please bear with us.

Sgt O'Sweat

Dear Sgt O'Sweat:

We have received several Centurion tanks which had modification instruction Veh J 287, Instr 66 completed on them, with the exception of the coolant level floats in the header tanks. The header tanks had been modified but blanking plates were installed in lieu of tank indicator units. Can we operate the tanks without the modification being completed? And when will the missing parts be available and who is authorized to complete the modification?

Cpl NO Sweat

Dear Cpl:

The vehicles can be operated without the level indicators being installed, just as you did before the modification instruction came out. But (and here's the point) crews must carry out their daily parades in accordance with the crew servicing pamphlet, and tank operator must keep a close watch on the temperature gauge. When a stock of indicators are received, 25 COD will make an automatic issue to those units holding tanks in which the modification has been only partially completed. Unit mechanics are authorized to install the indicators in the header tanks on those vehicles that are partially modified.

Sgt O'Sweat

Other Letters

Sir:

We receive with interest your RCEME Technical Bulletin and would take this opportunity to compliment the editors and contributing staff for a well written and worthwhile publication.

We note in your April 1966 issue that you are looking for additional contributors. This Squadron (39 Tech Sqn), which is the only RCEME Militia unit in western Ontario, would like to become a regular contributor and we would appreciate further information from you as to what type of material would be of interest.

(R L LaVigne)
Capt
2 I/C

SPANNER SPEAKS

4 Fd Wksp RCEME turned combat this week as we began our training at Soltau. It is during these training exercises that the Wksp is practiced deploying in wooded areas and setting up local defences. This offers many challenges especially for drivers of large vehicles with trailers. Parking space is usually confined to "snug fits" between trees and the vehicles must be backed in to allow for mobility on short notice moves. These skills are literally learned over night as often it is at night when they are executed. A proper job of camouflaging the vehicle is also a necessity and the nets if carelessly placed serve only to make a 2 1/2 ton truck and trailer look like a 5 ton. When the vehicles are hidden from air observation the next priority is the layout of defences from ground attack.

The defensive skills begin with a shovel and terminate with a rifle. The guard posts manned two by night and one by day insure everyone including most NCOs of a guard shift in each 24 hour period. While this is taking place the user units have penetrated our camouflage with the aid of a map reference and have found the Wksp site. Now our repair responsibility commences as the work begins rolling in. Sometimes sleep is hard to come by and if the weather turns inclement many of our numbers are turned from Jeckyll to Hyde. The cooks are famous for responding with inch thick steaks and all is soon forgotten.

The Forward Repair Platoon "the glory boys" of the Wksp has been here at Soltau since the beginning of the concentration providing their excellent repair in situation service. The Wksp since arrival is graced twice daily with visits from these forward repair types. During the day they drop by to pick up spare parts from the RCOC platoon and at night they provide the attacking force to test our defences. The first visit I suspect is also utilized as a reconnaisance to survey our position. In any case it makes for excitement in the wee hours of the morning and keeps us all alert. The unit officers of course consider all of this as training for the men, while the men consider it sport for the officers. In view of the fact the officers didn't receive any re-engagement bonus we can allow them some sport, and the training does serve to keep us all operationally sensitive.

The greatest individual reward gathered from the hardships of field training will of course be our greater appreciation of home and family when we return to Soest.

"All work and no play makes 'Joe' a dull boy" is a motto taken seriously by some members of this unit. In a recent BAOR Golf Tournament this unit was well represented in both team and individual competitions. The ability of our members to play golf has given rise to the possibilities of re-organizing the workshop along golfing lines for improved efficiency. Since a portion of the workshop is new being relocated it would not be to difficult to make minor alterations along these lines.

The previous control office building would make for a natural club house with minor expansion to the coffee-making facilities and a cashier wicket installed to receive tar-mac fees. The pro shop of course would be the receiving and issuing office. Here is where the customer reports with his equipment before it proceeds along the fairway of repair, Cpl Carmichael, the qualified pro, who operates this essential portion of the workshop can also give the customer information as to delays due to natural and artificial hazards.

After teeing off at the pro shop the vehicle is routed to an easy par three at the 'in and out' inspections. No hazard is expected here unless it is a BZ day and Ssgt Aubuchon has other customers playing through.

The trip to garrison workshop would be a par five and the secret of this hole is to play over the building and putt out through the back door. All other repair sections of the workshop would vary from pars 3 to 5 if one is adept with a sand wedge and can avoid the need of slow-moving parts. The last hole will bring the customer back to the pro shop where if the vehicle or equipment has been lost, repaints can be obtained for 25 cents.

Since we are always striving to improve our customer service, perhaps during the coming curling season consideration should be given to converting 4 Field into an eighteen hole workshop.

25 YEARS AGO

It was pretty much a standard December for A-21 Canadian Ordnance Corps Training Unit in Barriefield Camp in 1941. The usual awards for infractions of Article 40 and for being AWL were being presented almost daily to the unfortunate among the miscreants; Maj Gayford was away in Bowmanville on the matter of escaped POW; large numbers of ORs with rare foresight (about 25 year's worth) were taking advantage of regulations which allowed them to join the RCAF; the Commandant's Christmas message reminded all of the desperate position of our soldiers in Hong Kong; Maj KH McKibbin was named to the Chief Instructor's appointment that month; and officers unable to provide the Commandant with a plausible reason for being elsewhere than in Barriefield Camp, served the men their traditional Christmas dinner.

The Adjutant spent the month diligently signing daily orders. He warned against drinking on the trains; he approved groups and individuals coming and going; for innoculation parade, he provided the MO with a ready list of victims including Lieutenants RHC Hodgson, AL Maclean and GT Kirk, and cadets JL Loughridge and JP Sherren. Nor did Capt DE Mounteer overlook the need for competant Orderly Officers during the festive season; Lt Hodgson relieved Capt KR Ward on 24 December, and Lt AL Maclean got the clean-up spot, 2 January 1942.

All in all, Lt Col E Stuart Johnstone, MC seems to have run a well-regulated outfit, considering especially that the 2,000-more-or-less all ranks were largely sojourners. Capt Mounteer himself was to be SOS to Base Ordnance Workshop Camp Borden, and hand over the Adjutant's job to Capt DGT MacLean on 31 Dec.

Outside the recurring and predictable, one instance seems today to have retained noticeable and permanent stature - on Friday, 5 December 1941, the officers moved into their new mess. The war diary says, "This was badly needed". It is a rare entry; it does not bear the usual stamp of documentary boredom, the copyright of war diary recording:

"This is an event in the life of the officers for we have moved into the new mess and (it) should be commodious enough for us". And so the inheritance of today's lodgers was brought into use.

INTEGRATED TRADE STRUCTURE

As a follow-up on the article entitled "The Integration of RCEME Trades" RCEME Technical Bulletin April 1966, the chart is reproduced here to show the old and new trades for RCEME and their assignment to different pay fields.

Since it will take some time to prepare and distribute throughout the CDN Forces new trade specifications and related study material, trade progression practices in effect on 30 Sep 66 will continue to be followed and exams, tests and courses as applicable will be based on trade specifications in effect on 15 Sep 66.

Following the introduction of new trade specifications, a minimum period of six months will be allowed before personnel are required to write trade examinations based on these new trade specifications. The only exception, obviously, is in those trades where present trade qualification standards meet the requirements of the new trade specification. In these trades no transitional period will be required.

New trade examinations will be introduced progressively during 1967 and their effective dates will be promulgated by CFHQ. (CFHQ DTPP 324 of 5 Oct 66).

A brochure called "Canada's Armed Forces New Pay and Trade Structure" for non-commissioned ranks was handed out to personnel who attended the new pay briefings during the latter part of September 1966. The information contained in this brochure is important and should be read by all ranks.

Any comments on the new trade structure will be welcome. We will attempt to answer general interest questions in a future issue of the Bulletin.

CONVERSION TABLE

CANADIAN ARMY (R) RCEME TRADES

Army Trade	Integrated Trade	Pay field
Master Radio Technician	Communications Technician	7
	or	
	Avionics Technician	7
Radio Technician	Radio Technician	7
	or	
	Communications System Technician	7
Radar Technician Master Radar Technician	Radar Technician	7
Master Vehicle Technician	Vehicle Technician	6
Body Repairman	Vehicle Technician	6
	or	
	Metals Technician	5
Welder	Vehicle Technician	6
	or	
	Metals Technician	5
Vehicle Mechanic Tracked Vehicle Mechanic Wheeled	Vehicle Technician	6
Master Weapons Technician Weapons Technician	Weapons Technician (Land)	6
Master Instrument Technician Master Electrical Technician Instrument Technician Electrical Technician	Electro Mechanical Technician	6
Aircraft Technician C, N&V	(Airframe Technician or	7
Airplane Technician	{Aviation Technician or	7
Helicopter Technician	(Aero Engine Technician	7
Master Aircraft Technician	Aviation Technician	7
Master Aircraft I & E Technician Aircraft I & E Technician	Instrument Electrical Technician	6
Machinist Fitter	Machinist	6
Metals Technician Metals Technician (Ground) Metals Technician (Air)	Metals Technician	5
Clerk Administration	Administrative Clerk	3
Draughtsman E & M	Draughtsman	5

SOMETIMES THEY SURPRISE YOU

They say the punishment should fit the crime. This is what Corporal Gil McKinnon, an instructor with the apprentice soldiers at the Royal Canadian Electrical and Mechanical Engineers School in Barriefield, had in mind in assigning a young recruit to write an essay for him on the subject "Why I Like Looking at Lights".

Craftsman Apprentice Stephen Scott, a 16 year-old recruit from Toronto, In his sixth week of training, was inattentive during a drill instructional period. He was staring at an overhead light oblivious to what was going on around him. The slightly irritated instructor informed Scott that he would write a 500 word essay and have it on his desk the following morning.

Because of the heavy curriculum, it was expected that the finished product would leave something to be desired. Much to the surprise and pleasure of Corporal McKinnon, Stephen Scott turned in the following essay.

(Scott completed grade ten at C.W. Jerrey's Secondary School in Toronto before becoming an apprentice soldier and coming to Kingston in September. His hobby is reading.)

why I like looking at lights

By Cfn (App) SD Scott

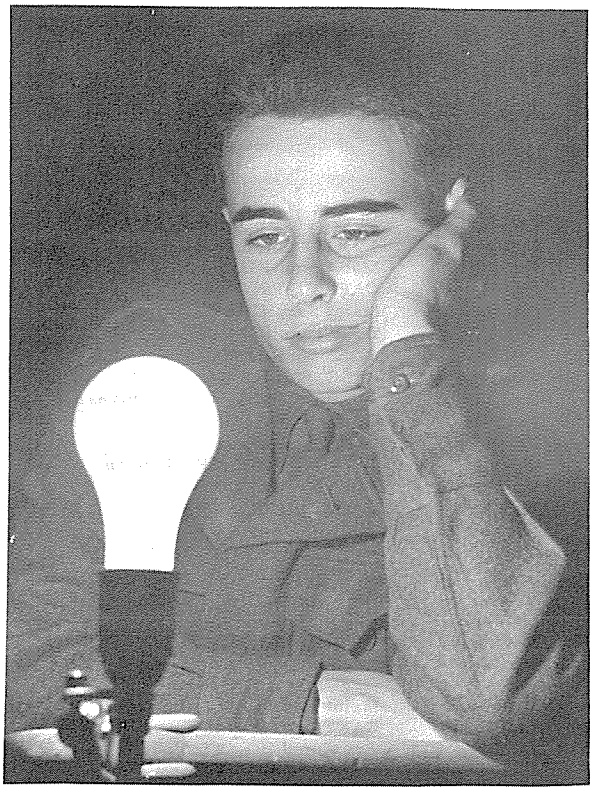
Men have been fascinated by lights ever since the days of the Neanderthal troglodytes who used to have fires in their caves. Besides giving off warmth and protection from fierce marauding mammals and reptiles, they gained comfort from looking at their fire, and while chipping the flint for their spears, they would gaze at the flickering light for hours on end. As the years passed by and mankind became more civilized and inventive they began to produce more interesting and better lights. They discovered that a string covered with wax would give off enough light to read by. In China, they discovered that gunpowder when mixed with chemicals made lights which were brightly coloured and pleased their eyes enough to make them feel that, at least for the present, their wildest dreams were coming true.

Some of the most puzzling lights to men were the stars, the sun, and the moon. At first, they thought that the stars and planets were gods, who looked over them and gave them troubles if they did not make sacrifices; so mankind made animal and human sacrifices to the twinkling shower of lights in the dark blue sky.

In the far north, the Eskimos worship the northern lights as gods because of their beauty and brightness. People use lights nowadays to do everything they want to after dark, such as hockey, baseball, football, pool, reading, writing essays, cleaning things, and for driving and walking also. People still worship lights in the form of television in which you can watch people doing sports, fighting wars, making love; or go back into the past or into the future in space-ships, bathyscopes, or stage coaches. You can see anything it is possible to imagine on television or in the movies. The lights of the present are clear or slightly foggy glass bulbs in which there is a thin filament which lights up when an electric current passes through it. The electric current comes along a copper wire at fantastic speeds. When it hits the filament, it causes heat and light. Because there is a vacuum surrounding the filament, the only heat that is noticeable is when some of the light energy changes to heat as it passes through the glass. Light, if it travelled in circles, could go around the earth seven and one half times in one second.

The lights which I was looking at were flickering on and off, at such a speed that is not normally noticeable to the human eye. However, one of them was dying out and caught my attention for just long enough to be noticed by Cpl McKinnon. When you think back over the uses of lights and their meaning to mankind ever since some sub-human, in the days of pre-history, hit two rocks together and started a fire, the result is awesome. If we had been born on a planet without any light, I wouldn't be writing this because mankind would not exist.

INSPIRATION



Cfn (App) Scott

"NEVER TOO OLD..."

Habits, because they are a barrier to change and progress, require serious attention. Dr. Harry Neyers, late Personnel Director of Frigidaire, was once asked about 'teaching old dogs new tricks.' He replied "That all depends on what you call old. Age is only a point of view. I know some old people who are young - and I know some young people who are old. For if you know all about something, you are old. And if you believe you are doing something as well as it can be done, you are old, yes, old enough to die.

"But if you are glad to admit that you know but little about anything, you are young. And if you are sure that everything can be done much better than it is now being done - or ever will be done - then you are young and growing. Prosperous years are ahead of you and all you control."

SUGGESTIONS RECEIVED

These files were received in Ld Mat Maint during Aug-Oct. The publications of the particulars here does not imply their acceptance but it does show that some of us are thinking.

Clement Gagnon Maintenance Section CFB Valcartier	Protective cover for oil plug on M113A1 final drive.
Sgt JD Dunsmore 217 Workshop CFB Esquimalt	Promotion of clerks to control officers.
Cpl GW Grogan 4 RCHA CFB Petawawa	Modifications to Mortar M30 and FN rifle; and to their special tools.
WO2 WE Davis Ld Mat Maint Mat Comd HQ	Gauge, compass unmounted, C1B1 pivot height adjustment.

THE BUZZCODE GENERATOR

(Idle Thoughts Inspired by the Buzzphrase Generator)

The article on page 48 of the April issue obviously describes a management tool of tremendous possibilities. The author, however, has not taken his thoughts to their logical conclusion. Imagine the possibilities for the creation of new code words using the language of the Defence Department as listed by the Buzzphrase Generator.

For instance the DEVIL (Development of Integrated Logistics) program is exercising the thought of many worthies at CFHQ at present. Using the Buzzphrase Generator and keeping to a similar theme, such code words as MEPHISTOPHELES (Mobile Empirical Programing Hardware, with Integrated Systematized Time-phase Options, for Protecting Helpless Engineers from Logistics Experts and Systems) and SATAN (Synchronized Attempt at Total Automatic Neology) come readily to mind.

Perhaps readers, Bullphrase Experts as many of you are, can suggest other examples.

W Rhodes, Major

WHO'S WHERE

As of 15 Oct 66

BRIGADIER

KH	McKibbin	CFHQ, CTS/DGELand

COLONELS

AHR	Lewis	202 Base Wksp, CFB Montreal
AL	Maclean	RCEME School, CFB Kingston
A	Mendelsohn	Mat Comd HQ, Asst DCOS Admin & Pers
WJ	Owens	CFHQ, CTS/DGELand
AM	Reid	Comptroller, Mob Comd HQ
KR	Ward	Mat Comd HQ, SSO Data Processing

LIEUTENANT COLONELS

J	Adams	CFHQ, CTS/DGELand
CH	Betts	CFHQ, CTS/DGELand
JC	Boughton	Mob Comd HQ SSO Maint
GW	Bruce	Mat Comd HQ (Ld Mat Maint)
DA	Campbell	CFHQ, CTS/DMLand
DG	Carlyle	Mat Comd HQ (Ld Mat Maint)
CG	Cavaghan	CFHQ, CP/DPCP
HL	Cohen	CFHQ, CTS/DGELand
KF	Collins	CFHQ, CTS/DGELand
BB	Cox	CFB Calgary
WH	Glover	CFB Gagetown
RHC	Hodgson	D/Comd't 27 COD RCOC, CFB London
EC	Ilott	CFHQ, CTS/DGELand
FG	Johnson	27 COD RCOC, CFB London
EG	Jones	RCEME School, CFB Kingston
CG	Lawrence	Mat Comd HQ (Ld Mat Maint)
AGM	Maitland	CASC, Kingston
ALD	MacDonnell	CFHQ, CG/D Automation
JH	MacLean	CFHQ, CTS/DGELand
CG	Provan	EBS Bn (CFB Gagetown)
CG	Racicot	MCCD/LAOS
RC	Rivers	Mat Comd HQ (Ld Mat Maint)
ANP	Roberts	Mat Comd HQ (Ld Mat Maint)
M	Ruscher	CFHQ, CTS/DMM
FJ	Sergi	NATO Armament Committee, Paris
JP	Sherren	Mat Comd HQ (Ld Mat Maint)
DJ	Tidy	CFHQ, CTS/DGELand

MAJORS

KI	Anderson	CFHQ, VCDS/DLFORT
P	Bateson	RCEME School, CFB Kingston
JMF	Bourassa	Mob Comd HQ (Maint Engr Sec)
JE	Brown	202 Base Wksp, CFB Montreal
GR	Burton	1 Coy, CFB London
LN	Bydal	Mat Comd HQ (Ld Mat Maint)
AB	Cantlon	4 Coy, CFB Montreal
FW	Chapman	EBS Bn (CFB Gagetown)
HW	Chapman	Mat Comd HQ (Ld Mat Maint)
JF	Clarabut	CFHQ, CP/DPI
BC	Clerke	Mat Comd HQ (Ld Mat Maint)
RDL	Connell	RCEME School, CFB Kingston
JH	Cooper	CFHQ, CTS/DM Air
EB	Creber	CBU (UNEF) Wksp Coy
JJE	Cuddihey	202 Base Wksp, CFB Montreal
LA	Daviss	CFHQ, CTS/DGELand
BM	Diebert	14 Coy, CFB Borden
JGR	Doucet	4 Fd Wksp, N. W. E.
RF	Fendick	Mob Comd HQ
DH	Fraser	CAFATT Tanzania
JJ	Garnett	Maint Sec, CFB Gagetown
DV	Geary	2 Fd Wksp (CFB Petawawa)
RE	Goulding	CDLS(L)/REME School
SA	Girdler	CFSC, Toronto
JR	Griffin	202 Base Wksp, CFB Montreal
WJN	Haggins	CFHQ, CTS/DGEA
DV	Hampson	CAFTT, Ghana
HV	Hann	27 COD RCOC, CFB London
PEV	Hansen	CDLS (W) / STAFF
CB	Hellyer	27 COD RCOC, CFB London
FA	Hlohovsky	CDLS (L) MOD/DFRDE
HW	House	Mat Comd HQ (Ld Mat Maint)
CA	Hurst	13 Coy, CFB Edmonton
FG	Hutson	CASC, Kingston
AJ	Jeffrey	3 Coy, CFB Kingston
MC	Johnston	CASC, Kingston
KR	Joslin	Trg Comd HQ, Winnipeg
KT	Kennah	CFSC, Toronto
NE	Laviolette	Maint Sec, CFB Valcartier
JW	Lelacheur	CAFTT, Ghana
RW	Libbey	Trg Comd HQ, Winnipeg
AM	MacDonald	10 Coy, CFB Winnipeg
AJ	Mac Gillivray	RCEME School, CFB Kingston
RH	MacLeod	6 Coy, CFB Halifax
JD	McDougall	1 Fd Wksp (CFB Calgary)
RL	MacIntosh	CDLS (W) US Army Wpns Comd
MD	McKinlay	Mat Comd HQ (Ld Mat Maint)
CA	Miller	CFSC, Toronto
CR	Morgan	Maint Sec, CFB Petawawa
DR	Mowbray	Mat Comd HQ (Ld Mat Maint)
DA	Nicholson	13 Coy, CFB Edmonton
PH	North	CFHQ, CTS/DGELand
WH	Norton	CFHQ, CP/DPCA
DB	Perrin	CASC, Kingston
WC	Perry	CFHQ, CTS/DMLand
R	Peters	RCEME School, CFB Kingston
HCR	Pfeiffer	CDLS (W) Detroit Arsenals
JN	Pinder-Moss	CFHQ, CTS/DGELand
W	Rhodes	CFHQ, CTS/DGELand
JA	Richards	202 Base Wksp, CFB Montreal
HA	Rosson	Mat Comd HQ (Ld Mat Maint)
LA	Sainsbury	CFB Halifax
GD	Savage	Mat Comd HQ (Ld Mat Maint)
RB	Screaton	CFHQ, VCDS/DPPEC (L)
RN	Shaw	2 Coy, CFB Toronto
WR	Shaw	CFHQ, CP/DTPP
JO	Sheehan	AAMU, CFB Rivers
WD	Sneddon	CDLS (L) (REME Tech Gp Woolwich)
WG	Svab	CFHQ, CTS/DGELand
AR	Thomsen	RCEME School, CFB Kingston
JM	Treleaven	CFHQ, CG/DGMEA
PA	Tuck	CFHQ, VCDS/DLFORL
RW	Vollett	11 Coy, CFB Chilliwack
EA	Williams	CDLS (L) (Mod/DAEP)

WR	Willing	CFHQ, VCDS/DSS
GA	Wright	CFHQ, CTS/DGELand
B	Yarymowich	SO Materiel Maint,HQ CBUE

CAPTAINS

AM	Adams	HQ 4 CIBG
LW	Armstrong	2 Coy, CFB Toronto
RE	Betzner	FGH CFB Calgary
GN	Brent	Mat Comd HQ (Ld Mat Maint)
JE	Brewster	11 Coy,CFB Chilliwack
PL	Burcombe	202 Base Wksp, CFB Montreal
HD	Byer	LdSH (RC) N. W. E.
JL	Calvert	AAMU,CFB Rivers
JNR	Campbell	CFB Halifax
FR	Carruthers	RMC, Kingston
G	Charles	CFHQ, CTS/DGELand/LETE
CA	Churchill	CCUNCYP
DL	Clarke	CBU (UNEF) Wksp Coy
BL	Code	1 Tpt Coy, RCASC
RF	Conway	229 Wksp, Camp Wainwright
JGD	Crookston	RCD CFB Gagetown
DH	Cumming	RCEME School, CFB Kingston
JS	Davies	RCEME School, CFB Kingston
OA	Edmond	27 COD RCOC, CFB London
RJ	Francis	1 Fd Wksp, (CFB Calgary)
AM	Gilbert	Mat Comd HQ (Ld Mat Maint)
NA	Graham	RCEME School, CFB Kingston
GE	Grainger	CFHQ, CTS/DGELand/LETE
PM	Graye	RCEME School, CFB Kingston
WJA	Groom	Mat Comd HQ (Ld Mat Maint)
GT	Hammond	CFHQ, CG/DMPC
RT	Hare	11 Coy, CFB Chilliwack
LM	Harvey	Mat Comd HQ (Ld Mat Maint)
HJ	Hellard	14 Coy, CFB Borden
O	Howard	202 Base Wksp, CFB Montreal
ID	Isbester	U of West Ont (PG Studies)
AF	Johannes	Mob Comd HQ (Maint Engr Sec)
JJ	Kane	Maint Sec,CFB Moose Jaw
DC	Kaufman	27 COD RCOC, CFB London
JR	Kaye	13 Coy, CFB Calgary
GW	Keays	1 PPCLI N. W. E.
FH	Leach	1 Tpt Hel Pl (Edmonton Det)
LA	Leflar	2 RCR N. W. E.
FG	Legg	CAFATT Tanzania
JW	Lowthian	CFHQ, CTS/DGELand
WF	Lucano	RCEME School, CFB Kingston
JA	MacDonald	RCEME School, CFB Kingston
RMG	MacKenzie	216 Wksp, CFB Chilliwack
GE	Maguire	CFSS, Toronto
DM	Maher	212 Wksp, CFB Shilo
RB	Manning	1 Tpt Hel Pl,RCASC (St Hubert)
MG	Masuda	RCEME School, CFB Kingston
GD	McCulloch	4 Fd Wksp, N. W. E.
AL	McEachern	1 RCHA CFB Gagetown
JG	Meek	2 RCHA N. W. E.
HJ	Millen	13 Coy, CFB Calgary
RW	Miller	RCEME School, CFB Kingston
HG	Morgan	CFB Petawawa
JL	Moyse	27 COD RCOC, CFB London
JF	O'Connor	202 Base Wksp, CFB Montreal
FA	Ouimet	Mat Comd HQ (Ld Mat Maint)
CA	Penny	4 Fd Wksp, N. W. E.
PP	Pospisil	AAMU, CFB Rivers
PG	Pothier	202 Base Wksp, CFB Montreal
CF	Potter	Air Transport Comd HQ, CFB Trenton
RH	Purton	Mat Comd HQ, SSO Catalogue
HG	Ray	Yuma Proving Grounds Arizona
WD	Roche	RCEME School, CFB Kingston
EA	Rochefort	HQ CBUE
AG	Rose	Trg Comd HQ, Winnipeg
BH	Simms	4 Fd Wksp, N. W. E.
WRL	Springford	AAMU, CFB Rivers
JA	Stott	10 Coy, CFB Winnipeg
GW	Swallow	Mat Comd HQ (Ld Mat Maint)
JT	Thompson	4 Fd Wksp, N. W. E.
RH	Thorn	RCEME School, CFB Kingston
RL	Walker	208 Wksp, CFB Rockliffe
DE	Wilson	RCEME School, CFB Kingston

LIEUTENANTS

JFXJ	Allaire	4 Coy, CFB Montreal
JH	Armstrong	LdSH (RC) N. W. E.
WD	Armstrong	RCEME School, CFB Kingston
FH	Atwood	CFB Petawawa
DS	Axford	CFHQ, CG/DMRE
KD	Baird	1 Fd Wksp (CFB Calgary)
WGA	Barrey	202 Base Wksp, CFB Montreal
JT	Bart	10 Coy, CFB Winnipeg
JLSC	Belisle	2 Tpt Coy, RCASC
RG	Bell	RCEME School CFB Kingston
RA	Bergeron	RCEME School, CFB Kingston
DL	Black	2 Fd Wksp, (CFB Petawawa)
JABR	Bouchard	4 Coy, CFB Montreal
JPA	Boucher	CFB Valcartier
JBR	Bouliane	CFB Valcartier
R	Boyko	3 RCHA CFB Winnipeg
RP	Britt	RCEME School, CFB Kingston
FN	Brodie	CFB Gagetown
JJR	Carrier	RCEME School, CFB Kingston
TF	Cawsey	CFNBCW School, Borden
JAP	Charlebois	1 R22R CFB Valcartier
JDG	Choquette	202 Base Workshop, CFB Montreal
JT	Cooper	EBS Bn (CFB Gagetown)
GW	Davies	1 Cdn Sigs Regt
JP	Deschenes	RCEME School, CFB Kingston
DG	Dinsmore	4 Tpt Coy, RCASC
SCG	Dupont	RCEME School, CFB Kingston
HT	Edworthy	RCEME School, CFB Kingston
TJ	Enright	CDLS (W) U of Virginia
DH	Feller	10 Coy, CFB Winnipeg
RJ	Ferguson	EBS Bn (CFB Gagetown)
JNR	Fischer	HQ CBUE
RR	Fraser	2 Fd Wksp (CFB Petawawa)
WJA	Fryer	Mat Comd HQ (Ld Mat Maint)
AB	Fuller	HQ CBUE
JJJ	Fyfe	4 Fd Wksp, N. W. E.

AR	Gillis	RCEME School, CFB Kingston
JJC	Girard	2 Fd Wksp (CFB Petawawa)
PAR	Glynn	CFB London (U of Waterloo)
GWE	Godson	EBS Bn (CFB Gagetown)
RD	Green	RCEME School, CFB Kingston
DR	Hamilton	RCEME School,CFB Kingston
JI	Hanson	4 Fd Wksp, N. W. E.
JR	Hardy	CF Recruiting Centre, Calgary
DR	Hartwick	RCEME School, CFB Kingston
TW	Healey	2 Coy, CFB Toronto
LLA	Hellemans	RCEME School, CFB Kingston
KW	Henderson	CFHQ, CP/DPCA
WG	Hinton	RCEME School, CFB Kingston
JS	Holt	RCEME School, CFB Kingston
JJPR	Jobin	RCEME School, CFB Kingston
EF	Joyner	3 Coy, CFB Kingston
HG	Kayne	Mat Comd HQ (Ld Mat Maint)
JEY	Kingsbury	RCEME School, CFB Kingston
WW	Laird	RCEME School, CFB Kingston
JR	Lamb	EBS Bn (CFB Gagetown)
RL	Langdon	RCEME School, CFB Kingston
JPR	Leblanc	RCEME School, CFB Kingston
CW	Mac Donald	Mat Comd HQ (Ld Mat Maint)
EB	MacLellan	Mat Comd HQ (Ld Mat Maint)
JJP	Marchildon	RCEME School, CFB Kingston
PC	Marriner	RCEME School, CFB Kingston
JHPL	Martel	2 R22R N. W. E.
WB	Mason	RCEME School, CFB Kingston
WR	McCaughan	HQ CBUE
LF	McLeod	CFB Gagetown
GR	Melvin	CFB Valcartier
WA	Mersereau	RCEME School, CFB Kingston
SGG	Nappert	RCEME School, CFB Kingston
A	Nellestyn	CDLS (L) (U of London)
O	Oishi	1 Fd Wksp (CFB Calgary)
JC	O'Rourke	RCEME School, CFB Kingston
JLPJ	Pacquette	202 Base Wksp, CFB Montreal
TJ	Panke	RCEME School, CFB Kingston
MC	Patterson	RCEME School, CFB Kingston
TR	Patterson	RCEME School, CFB Kingston
JMVG	Pedneault	RCEME School, CFB Kingston
V	Pergat	RCEME School, CFB Kingston
JAM	Perreault	RCEME School, CFB Kingston
RMC	Pirt	AAMU,CFB Rivers
JMB	Podesto	RCEME School, CFB Kingston
NE	Pothier	1 RHC CFB Gagetown
RV	Potter	RCEME School, CFB Kingston
GA	Riley	202 Base Wksp, CFB Montreal
WD	Roche	RCEME School, CFB Kingston
JGHL	Roy	202 Base Wksp, CFB Montreal
J	Sanders	CBU (UNEF) Wksp Coy
LFG	Scagnetti	RCEME School, CFB Kingston
RH	Seguin	CBU (UNEF) Wksp Coy
HT	Simpson	RCEME School, CFB Kingston
DB	Sinden	RCEME School, CFB Kingston
LP	Siwik	RCEME School, CFB Kingston
GAJ	Smith	RCEME School, CFB Kingston
GE	Smith	Mat Comd HQ (Ld Mat Maint)
NC	Smith	CFHQ, CTS/DGELand/LETE
JD	Snell	207 Wksp, CFB Kingston
CN	Sochasky	RCEME School, CFB Kingston
JH	Spackman	RCEME School, CFB Kingston
RGJ	St Aubin	Mat Comd HQ (Ld Mat Maint)
DW	Stevens	Mat Comd HQ (Ld Mat Maint)
GG	Stewart	1 Fd Wksp (CFB Calgary)
TW	Strang	13 Coy, CFB Edmonton
JRMB	Taschereau	RCEME School, CFB Kingston
IJ	Taylor	RCEME School, CFB Kingston
R	Thomas	202 Base Wksp, CFB Montreal
JEGA	Touchet	RCEME School, CFB Kingston
AD	Tupper	1 RCR CFB London
JNJA	Turcotte	8 CH CFB Petawawa
BJ	Walker	Mob Comd HQ Longueuil Que
GR	Walker	1 Fd Wksp (CFB Calgary)
J	Walker	1 PPCLI, N. W. E.
ET	Weston	Mat Comd HQ (Ld Mat Maint)
TG	Whitehead	Mat Comd HQ (Ld Mat Maint)
WJ	Wood	Mat Comd HQ (Ld Mat Maint)

SECOND LIEUTENENTS

RL	Langdon	RCEME School, CFB Kingston

UK EXCHANGE OFFICERS
REME

Maj D	Hill	RCEME School, CFB Kingston
Maj ND	Matthews	Mat Comd HQ (Ld Mat Maint)

THE CENTENARY OF CONFEDERATION

Only once in a hundred years is one invited to the celebration of a centenary. The year of our centenary is not only a time to refurbish old monuments, create new amenities, and bolster existing cultural activities. It gives us an opportunity to pay attention to what is significant in the social and political and intellectual development of our country and in its present environment.

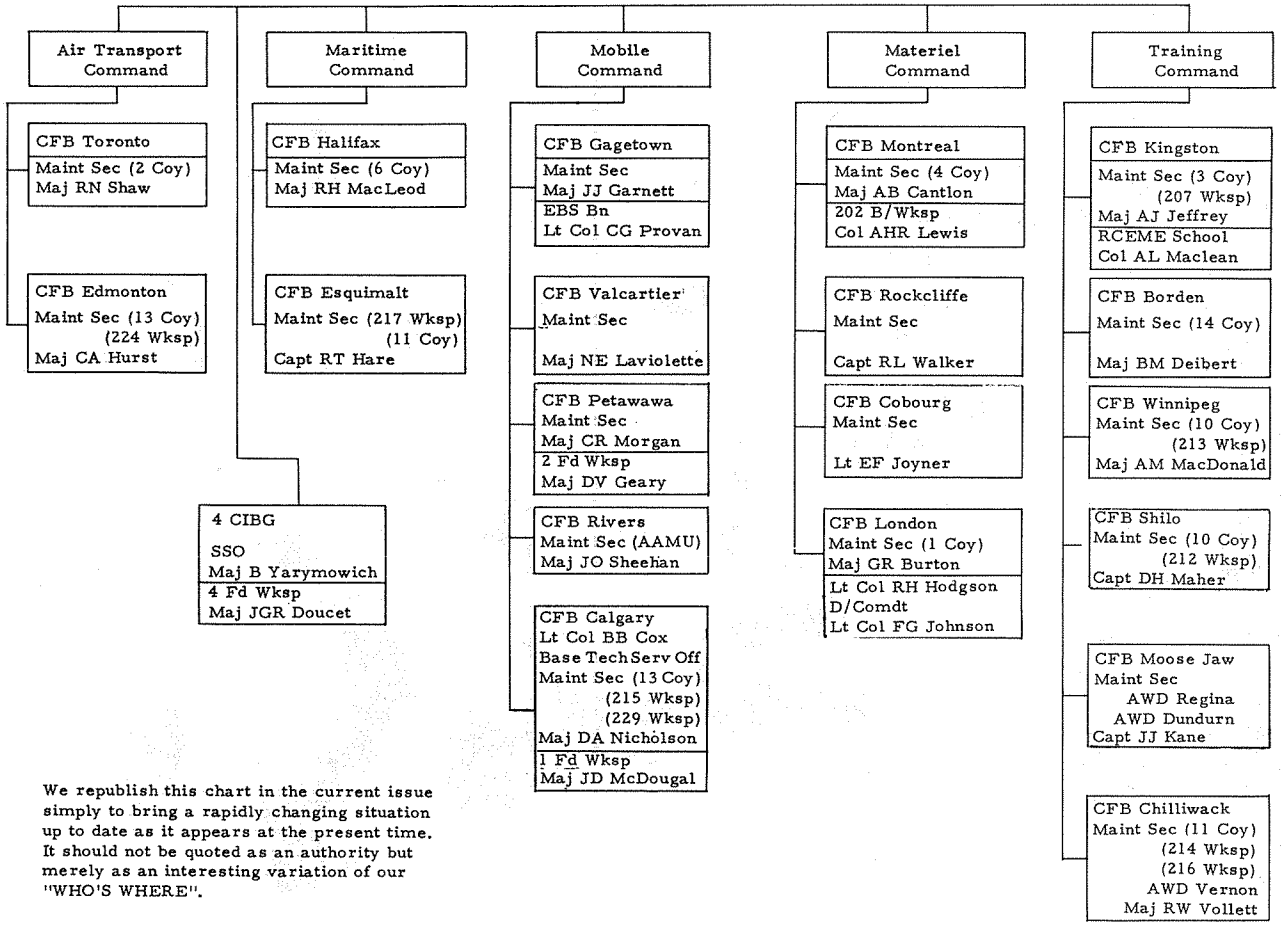
We cannot look back, on our hundredth national birthday, on the past as nothing more than a pageant which calls for applause and gratification. As the procession of the years passes in review, each year decked with its crown of laurel leaves for achievement and its chaplet of rosemary for memories, we must not forget that 1967 will take its place in the cavalcade.

Next year is a new year with no mistakes in it yet. Like the birth of every new day, it is a reprieve granted by the governor of time to his subjects who may have squandered a legacy of early moments.

If we face it with assurance, resolved to bear turns of fortune with manful spirit and to add what good we can to the great goodness we inherited, future generations may remember us and say: "These people saw a vision in dark and troubled days, and though tyranny raged in many parts of the earth they built a shining nation out of the dust."

-Condensed from Royal Bank
of Canada Monthly Letter.

RCEME OFFICERS & ELEMENTS in CF BASES



We republish this chart in the current issue simply to bring a rapidly changing situation up to date as it appears at the present time. It should not be quoted as an authority but merely as an interesting variation of our "WHO'S WHERE".

FINAL-DRIVE-TO-HULL MOUNTING SCREWS

A number of failure reports have been submitted stating that final drive mounting screws are losing their torque.

Technical manual TM9-2300-224-20/2/1, para 172 Table 21 shows two torques for these screws: 55-60 ft/lb for a grade 5 screw, and 100-110 ft/lb for a grade 8 screw. The grade 5 screw can be identified by the three radial lines on its head; the grade 8 screw by the six radial lines.

It is recommended that:

(a) Units be advised to check these screws for proper torque;

(b) On vehicles in which the screws continually work loose they be checked to ensure that they are all grade 8. Replace grade 5 screws with grade 8 and torque them to 100-110 ft/lb.

(c) Workshops replace grade 5 screws with grade 8 when replacing a final drive assembly.

Part number for the grade 8 screws is 5305-719-5240 as shown in change 3 to TM9-2300-224-20P/3, page 166.

ARMED FORCES COUNCIL

(Canadian Forces Photo)

The Armed Forces Council is composed of the Chief of Defence Staff, the Vice-Chief Defence Staff, Chief of Personnel, Chief of Technical Services, Comptroller-General and commanders of the six functional commands. Purpose of the council is to advise the CDS on matters of broad policy, major programs and the control of major activities.

Left to right, seated:
Vice Admiral RL Hennessy, DSC, CD, Comptroller General; Lieut-General WAB Anderson, OBE, CD, Commander Mobile Command; General JV Allard, CBE, DSO, ED, CD, Chief of Defence Staff; Rear Admiral JC O'Brien, CD, Commander Maritime Command; Air Marshal FR Sharp, DFC, CD, Vice-Chief Defence Staff;

Standing:
Air Commodore GG Diamond, AFC, CD, Commander Air Transport Command; Air Marshall EM Reyno, AFC, CD, Chief of Personnel; Major General MR Dare, DSO, CD, Deputy Chief Reserves (attended as an observer); Air Vice Marshall RC Stovel AFC, CD, Commander Training Command; Major General RP Rothschild, MBE, CD, Commander Materiel Command; Rear Admiral HG Burchell, CD, representing the Chief of Technical Services; Air Vice Marshal ME Pollard, DSO, DFC, AFC, CD, Commander Air Defence Command.

ORGANIZATION CHART
CFHQ AND COMMANDS

Chief of Defence Staff
Gen JV Allard

CANADIAN FORCES HEADQUARTERS

- Vice Chief of Defence Staff — A/M FR Sharpe
- Chief of Personnel — A/M EM Reyno
- Chief of Technical Services — Lt Gen LGC Lilley
- Comptroller General — V/Adm RL Hennessy

COMMANDS and BASES

- Air Defence Command — Longueuil — AVM ME Pollard
  - CFB Chatham
  - CFB Cold Lake
  - CFB Bagotville
  - CFB North Bay
  - CFB Comox
- Air Transport Command — Trenton — A/C GG Diamond
  - CFB Goose Bay
  - CFB Uplands
  - CFB Trenton
  - CFB Toronto
  - CFB Edmonton
- Maritime Command — Halifax — R/Adm JC O'Brien
  - CFB Halifax
  - CFB Shearwater
  - CFB Greenwood
  - CFB Summerside
  - Maritime Command (Pacific) — R/Adm JA Charles
    - CFB Esquimalt
- Mobile Command — St Hubert — Lt Gen WAB Anderson
  - CFB Gagetown
  - CFB Valcartier
  - CFB Petawawa
  - CFB St Hubert
  - CFB Calgary
- Materiel Command — Rockcliffe — MajGen RP Rothschild
  - CFB Moncton
  - CFB Montreal
  - CFB Rockcliffe
  - CFB Cobourg
  - CFB London
- Training Command — Winnipeg — AVM RC Stovel
  - CFB Cornwallis
  - CFB St Jean
  - CFB Kingston
  - CFB Borden
  - CFB Clinton
  - CFB Rivers
  - CFB Winnipeg
  - CFB Shilo
  - CFB Portage la Prairie
  - CFB Moose Jaw
  - CFB Gimli
  - CFB Penhold
  - CFB Chilliwack

- 4 CIBG — Brig EAC Amy
- 1 Air Div — A/V/M RJ Lane

ANSWERS TO PROBLEM SET No 2

1. The number of steps in the escalator can be determined by first finding the rate of movement of the escalator.

Let r be the rate of movement of the escalator. From the two rates at which the colonel ascends the steps, we can see that it takes him 20 seconds and 16 seconds to reach the top.

Therefore;

$$(1 + r)20 = (2 + r)16$$

From which;

$$r = 3 \text{ steps/second.}$$

Thus the number of steps in the escalator equals the number of steps the colonel takes plus the movement of the escalator during that time.

Number of steps $20 + 3x20 = 80$ steps
or $32 + 3x16 = 80$ steps

3. The traveller can give his landlady one link a day if he cuts as few as two links from the chain. By cutting the fourth and eleventh links he obtains two segments containing one link and segments of 3, 6 and 12 links. Combining these in various ways will make a set of any number from one to 23.

4. The mirror Y is a mirror on the wall. The mirror X is the secretary's pocket mirror which she is holding parallel to the wall mirror. Thus, as she moves away her reflection in the mirror X will also appear to be moving away from the man as he observes the reflections in Y.

5. Cryptogram

$$\begin{array}{r} 99 \\ \times 99 \\ \hline 891 \\ 891 \\ \hline 9801 \\ +199 \\ \hline 10000 \end{array}$$

2. The solution to the integer problem is a difficult one to solve mathematically. Since the length of the number N is unknown, let N have the following form.

$$N = a_n a_{n-1} a_{n-2} \cdots a_3 a_2 a_1 a_0$$

Where each a_n represents a digit of the number N.

From the narrative;

$$\frac{7}{2} N = a_{n-1} a_{n-2} \cdots a_2 a_1 a_0 a_n$$

We now consider the recurring decimal, x, which has as its recurring digits the number N.

That is to say;

$$x = .a_n a_{n-1} a_{n-2} \cdots a_2 a_1 a_0 a_n a_{n-1} a_{n-2} \cdots a_2 a_1 a_0 a_n \cdots$$

Then,

$$10x = a_n . a_{n-1} a_{n-2} \cdots a_2 a_1 a_0 a_n \cdots$$

And,

$$10x - a_n = .(a_{n-1} a_{n-2} \cdots a_2 a_1 a_0 a_n) a_{n-1} a_{n-2} \cdots$$

The recurring part of $(10x - a_n)$ is similar to the number $\frac{7}{2} N$

Therefore;

$$10x - a_n = \frac{7}{2} x$$

$$\text{or, } x = \frac{2a_n}{13}$$

To find the smallest number, let $a_n = 1$.

And, by division;

$$x = .153846153486\ldots\ldots$$

From this we can say that the required number N is 153846.

PROBLEM SET No 3 — Try to Solve these in your head

1. Colonel Wrench throws an ordinary die, then his 21C throws the same die. What is the probability that the Colonel will throw a higher number than his 21C.

2. A triangle has sides of 13, 18 and 31 inches. What is the triangles area?

3. The edge of a reservoir is a perfect circle. A fish starts at a point on the edge and swims due north for 600 feet, which takes him to the edge again. He then swims due east, reaching the edge after going 800 feet. What is the diameter of the reservoir?

4. A statistician gave mathematical tests to everyone who lived in a village of 6000 people and at the same time measured the lengths of their feet. He found a strong correlation between mathematical ability and foot size. Explain.

5. A man wishes to build a house on a large triangular plot of land, then to construct three straight roads, each leading from the house to a side of the triangle and each road perpendicular to the side. The triangle is equilateral. Where should he place his house to minimize the sum of the lengths of the three roads?

6. In going over his books one day a bookkeeper for a toy company noticed that the word "balloon" had two sets of double letters, one following the other. "I wonder," he said to himself, "if there is an English word containing three sets of double letters, one right after the other." Can you think of one?

7. Mrs Smith has nine cigarettes remaining in a package. She wants to stop smoking once she has finished her last remaining cigarettes. If she can make a new cigarette by wrapping three cigarette butts in a piece of cigarette paper, how many cigarettes can she smoke before she finally quits?

8. A fish weighs 20 pounds plus half its own weight. How much does it weigh?

by Capt RE Betzner
Offrs Mess
The Fort Garry Horse
Calgary, Alta